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AS Arthur Hale suggests in a letter which is published on another page of this issue, the men who can do the most to increase the efficiency of freight equipment are those who are on the firing line. The higher officers are best situated to map out policies and devise methods for improving and correlating the work of those directly concerned with the handling of trains and cars, but the way that the trainmasters, yardmasters, train despatchers, agents and trainmen do their work will determine whether the number of miles moved per day and the number of ton miles handled per day by each unit of equipment will be materially increased. Recognizing this fact, the *Railway Age Gazette,* like Mr. Hale, would like to hear what the men who are constantly on the firing line are doing to expedite the movement of cars and otherwise increase their efficiency. What new methods have you adopted, Mr. Trainmaster, and you Mr. Yardmaster? What results have you got and what suggestions have you to make, the adoption of which would reduce delays to cars, especially in yards and at stations? Your fellow trainmasters and yardmasters, and also the higher railway officers throughout the country, would like to have all the information and all the suggestions along this line that you can place at their disposal. There is no channel through which you can better place your information and suggestions before them than through the columns of the *Railway Age Gazette,* and if you will send them to this paper we shall take great pleasure in publishing them. Not only would what you have to say be of interest and value to others, but what others have to say would be of interest and value to you. There is always profit in the interchange of information and opinions between those who are engaged in the same kind of work and who are anxious to improve the way that they are doing it. The method which you have used to improve conditions may not seem to you either very new or very remarkable, but a description of it may prove interesting, valuable to men occupying corresponding positions on your own and on other railways, and to the higher officers as well.

THE recent arbitration of the wage demands of the enginemen of the Chicago & Western Indiana and the Belt Railway of Chicago went against the employees. F. A. Burgess, the representative of the employees on the arbitration board dissented, and in his dissenting report said: "I am strongly of the opinion that the decision of the majority of this board will not settle the question, but simply postpones for twelve months further action. With this thought in mind, together with the knowledge that the findings of the majority of this board will invite severe criticism of the enactment that made it possible to adjust labor controversies in this manner, it is beyond question of doubt that an ultimate crystallization of thought resulting in opposition to this enactment at the national capital is certain to follow." The Erdman mediation and arbitration act was passed in 1898, at the instance of the railway labor brotherhoods. The Newlands amendment to it was passed this year at the instance both of the brotherhoods and the railway managements. Practically every important arbitration under the Erdman act has resulted to the advantage of the employees. When, however, a single arbitration in a relatively unimportant case goes against them, their spokesman finds ground for "severe criticism of the enactment" and sees occasion for a movement for its repeal. Suppose, for the sake of argument, that the result of this particular arbitration actually was unjust: is that a sufficient reason for attacking the law under which it was conducted? The railway managers have thought the results of most of the arbitrations under the law have been unjust; but they have not made that an excuse for complaining at its requirements—except that limiting the number of arbitrators to three, for the correction of which feature the roads and the brotherhoods both appealed to Congress. Some of the labor leaders are very poor sports. They find fault with the rules of the game whenever a game goes

against them, even though they have made the rules themselves. From a long career of success they seem to have concluded that whenever they suffer a reverse the trouble must be with something besides their case or the way in which it has been presented. What they really want, apparently, is an arbitration law entitled, "An Act to provide that every controversy between common carriers and their employees shall be submitted to an impartial board of arbitration, which shall be composed entirely of walking delegates, and which shall in all cases give the employees all that they demand, with 10 per cent. additional as an honorarium for not demanding more."

THE sweet reasonableness characterizing Mr. Burgess' attitude regarding arbitration is fully equalled by that marking the attitude of the Brotherhood of Locomotive Engineers regarding the new rules recently put into effect on the New York, New Haven & Hartford by General Manager Bardo. One of the rules provides that in case of the promotion of engineers or their assignment to special runs "fitness" must be as much a governing condition as "seniority." To a rational mind there does not seem to be anything especially outrageous in that idea. The New England public and the people of the United States are holding the officers of the New Haven to a stern accountability for the collisions and derailments that have been occurring on that road. One of the most certain means of promoting safety in train operation is to promote employees according to their merits, giving to the best men the fastest and most important runs. And one of the best ways to cause accidents is to assign or promote men to runs that they are not fit for. With due regard to its responsibility and duty the New Haven proposes that instead of seniority controlling promotions and assignments due consideration shall be given to fitness. This means, of course, that the management, which is held responsible by the public for results, shall exercise its best judgment in assigning enginemen to runs. Why is the New Haven now under fire? Is it not because people believe that the old management failed to do just this thing? And yet, because the present management insists on considering fitness as well as seniority, the enginemen are taking a strike vote. Can you beat it?

IN the discussion between the railways and the Board of Engineers of the Interstate Commerce Commission regarding the preparation of maps and profiles, it would seem that the representatives of the railways have the better of the argument. The specifications issued by the commission bear a strong resemblance to those under which the valuation work in the state of California is now being carried on. While the railways in that state objected to these specifications, they did not make this an issue. However, when similar specifications are extended over the entire country the objections become increasingly important. The specifications issued by the Interstate Commerce Commission do not appear entirely practical in several respects. In the first place, the preparation of all maps to an absolutely uniform scale, regardless of the fact that this may mean the redrawing of many maps corresponding to the specifications in other regards, places an unnecessary expense upon the railways while gaining a theoretical rather than a practical advantage. It is estimated that the redrawing of these maps will require an expenditure of $5,000,000, and surely the ordering of an expenditure of this amount by the Interstate Commerce Commission should be carefully considered beforehand. The filing of original tracings rather than blue prints or vandykes with the commission is another point of controversy. Here again the advantages of tracings over vandykes would not seem to justify the increased expense. There is always a tendency of those having the power to order work done at the expense of the other party to require more than when they pay the bills themselves. For this reason, due consideration should be given to the arguments of the railways. The specifications would appear to be impracticable in that in some instances they require more information upon maps than it is possible to present in a legible form. It would seem that the data regarding the character of masonry foundations, the depth of penetration of piles, etc., could be more properly included in the written description of the bridge accompanying its appraisal. Maps were presented to the commission by various railways illustrating the confusion which would result if all the data asked for in important cities such as New York and Chicago was included on these maps. It is to be hoped that in rendering its decision, the Interstate Commerce Commission will give due consideration to the objections raised by the railway engineers, and will require only such information and maps as are necessary for the proper valuation of the carrier's properties.

DURING April and May, 1912, we published a series of articles on "Defective Box Cars and Damaged Freight," in which the causes of loss and damage to lading from this source were clearly traced, and in each case suggestions were made as to how the defects might be remedied and conditions improved. The statement was made in an editorial on "Defective Box Cars" in the *Railway Age Gazette* of April 12, 1912, page 829, that between 11 and 12 per cent. of the money paid out for freight claims on the St. Louis & San Francisco for the year ending June 30, 1911, was for damage which was directly traceable to defective equipment, and that if it was possible to compute that part of the damage caused by rough handling, robbery and wrecks, which was primarily due to defective equipment, the percentage would be two to three times as great. It was suggested that on this basis the railways as a whole were paying out from $4,000,000 to $10,000,000 a year for damage to and loss of freight because of defective equipment. Since the publication of the above mentioned series of articles the Frisco has had 1,000 box cars built in which special precautions have been taken to prevent possibility of pilfering from the cars, or damage to or loss of lading. So well have these features been taken care of that we have found it necessary to go more thoroughly into the details of the design in the article which appears elsewhere in this issue than is our usual custom. It will be seen that the design incorporates features which were used in both the Canadian Pacific and Santa Fe box cars, which were described in the *Railway Age Gazette* of May 10, 1912, as examples of the best steel frame and wooden box cars from the freight claim standpoint—and probably also from the standpoint of cost of maintenance. The design in general follows the outside steel frame cars, first introduced on the Canadian Pacific, while some of the details, including the carlines, follow the Santa Fe practice. Other important details are original with the Frisco, and are based on extensive observations on the part of its officers, who for a considerable time have been giving the problem of freight claims and maintenance of equipment special attention.

THE construction of the Buchannon & Northern, which is described elsewhere marks the entrance of the Pittsburgh & Lake Erie and the Pennsylvania into the West Virginia coal fields, the third owner of the new line, the Baltimore & Ohio, already reaching this district. It also marks the opening for development of a new territory on the west side of the Monongahela river. Aside from these facts, the principal feature of interest in connection with its construction consists in the methods used for overcoming the unusual difficulties encountered from slides. Slides are very commonly encountered on construction work, especially in side hill cuts, and the methods used in dealing with them must depend very largely on the nature of the moving material and the character and inclination of the underlying strata. In many cases in cuts the only thing which can be done is to remove the material back to such a slope that it will remain at rest. Where the slides are below grade on fills and are carry-

ing entire fills out of line, as was frequently the case on the Buchannon & Northern, the problem is more difficult. The dumping of more material on the up-hill side of the fills in an attempt to maintain the alinement frequently increases the movement. The weighting of the toe of the slope by the construction of a berme is frequently effective, but was not practicable here, for the slope extended into the river in many instances. The tremendous pressure exerted by slides of this nature requires that retaining walls, if adopted, be of large section if they are to be effective. Near the south end of the line a wall of this nature was constructed varying from 12 to 26 ft. in height, very little of which showed above the ground after the work was completed. Where it is possible to use it the most successful means of stopping slides of this nature is by bonding the moving material to the strata on which it is sliding. This was done in several instances by breaking up the lower strata by dynamite; and in other instances where the shale was too soft to be shot the strata were bonded together by piles extending through the moving material into the stationary material, and also with horizontal ties, extending into the stationary material.

A SUGGESTION FOR RAILWAY CLUBS.

A. L. HUMPHREY, vice-president and general manager of the Westinghouse Air Brake Company, made a suggestion to the members of the Railway Club of Pittsburgh, at the September meeting last Friday, which in some form or other could be followed up to advantage by the other railway clubs and railway technical associations throughout the country. The effectiveness of the work of most of the railway clubs is minimized because of a lack of definite aims and policies in preparing the programs for the year; and this is also true to a greater or less extent of many of the other organizations which discuss railway problems. The secretaries, officers or committees, as the case may be, arrange to secure reports or papers from different individuals without reference to any relationship between these papers, or with no definite plan as to the order of their presentation, whereas if some important problem was selected and different phases of it were assigned for discussion at the various meetings throughout the season, with the idea of finally reaching some goal and making definite recommendations to bring about better practices, the work of the clubs would prove of far more interest and value to the membership at large. As it is now, many of the subjects which are selected for discussion are of interest to only a limited portion of the membership, and too often the great majority of the subjects chosen are of special interest to only one class of members—usually the mechanical department officers.

Mr. Humphrey, after directing attention to the fact that the first safety device—the air brake—had been invented and developed in the Pittsburgh district, and that the same thing was also true of the electro-pneumatic semaphore automatic signal, one of the greatest factors in safety work; the solid steel wheel and the steel freight car; and also that the first steel passenger train car was built in Pittsburgh, recommended that the Railway Club of Pittsburgh make a record for itself by being the first organization of its kind to give proper and adequate consideration to the subject of welfare work. Before making this recommendation he described with aid of stereopticon views the very extensive work which has been done along these lines by the Westinghouse Air Brake Company in connection with safety devices in the shops, the education of apprentices and workmen, the improvement in sanitary conditions and the building of homes for the workmen which are furnished to them at a reasonable rental. A much greater amount of this sort of welfare work is being done by the railways and industrial corporations than the general public has any idea of, and Mr. Humphrey's idea apparently was that the discussion of these subjects by the railway club would not only give the public and employees a better comprehension of what was being done, but would enable the railways to compare the results which are being obtained by various measures which are being tried out, and to improve the work along different lines where some of them may have been weak or have done nothing at all.

While Mr. Humphrey did not specify the various phases of the subject which might be considered to advantage, he undoubtedly had in mind the pension systems which have been in effect on a number of roads for such a length of time that exact statements may be made as to the concrete results which have followed their introduction; the same thing is true of the relief department established on many roads, the railroad Y. M. C. A. movement, the modern systems of apprenticeship training and the developing of workmen, the safety first movement, the measures which have been developed on some roads for protecting the employees from loan sharks, and sanitary measures of various sorts which have been installed to protect both the employees and the public. Other subjects which might also be considered under this head would be the methods of wage payment so as to afford the least inconvenience to the employees, and the possibility of encouraging men to own their own homes. In connection with this latter suggestion, one railway officer has given serious consideration to the formation of loan associations, backed by the railroads, which would enable the men to buy property and build their homes; the services of the railroad company's legal, architectural and storekeeping departments, to be extended to these men so that their homes may be purchased under the most favorable conditions. Several meetings of the club could be devoted to the consideration of these welfare problems with excellent results, and it would then be in a position to make authoritative recommendations on the subject. The other railroad clubs could undoubtedly select equally important subjects which could be discussed and followed up to splendid advantage.

RESPONSIBILITY OF RAILWAY MANAGEMENTS FOR ACCIDENTS.

THE report of Commissioner McChord regarding the North Haven collision, an abstract of which is given elsewhere in this issue, deals specifically with this accident alone. The reasoning and conclusions in it may, however, be given an application to the railway accident situation in general, and perhaps Mr. McChord meant that they should be. The first feelings of many railway directors and officers on reading the report may be those of irritation and resentment. Their first impulse may be to criticize Mr. McChord and many of the things that he says. Certainly, both the substance and tone of the document lay Mr. McChord wide open to severe criticisms. He makes some erroneous statements of fact; he refrains from saying some of the things that he ought to have said; and in some cases what he does say is expressed in language scarcely befitting a semi-judicial officer of the government of the United States.

He says that "there were in use (on the New Haven) antiquated signals which were condemned by the locomotive engineman." The locomotive engineman did not condemn the *signals,* but a signal *system* that had no distant signals. "With distant signals," the report continues, "the system would be much safer." What might very properly have been said was that in time of fog high speed is absolutely unsafe without distant signals. It is recommended that while a new signal system is being installed between Springfield and New Haven "either distant signals should be provided in connection with all the signals now in use, or the signals should be properly overlapped, or block operators should be located at stations along this line and required to space trains a full block apart." The last recommendation would mean the installation of a manual block system which would keep trains an average of four miles apart. This would be un-

necessary and wasteful, and would introduce a new element of uncertainty, except in times of fog. It is said with reference to Engineman Miller that "officers directly in charge should have kept sufficiently close watch over an engineman performing such service to know absolutely whether or not he was taking proper rest." This is simply one way of saying that officers directly in charge should exercise a surveillance over employees which would be impossible, and which the employees would bitterly resent if it were possible. The recommendation that enough flagmen be provided so that a flagman need never be recalled is a brief and unsatisfactory treatment of a very difficult problem.

Mr. McChord traces the responsibility for the collision up to the directors of the road, whom he sensationally describes as "magicians in the art of finance and wizards in the construction and operation of great systems of railroads." In the last paragraph of his report he says, "An adequate system of superintendence and supervision should be immediately arranged which will give those in authority definite and positive information as to whether or not the safety requirements and rules of this railroad are observed." Having used language regarding the directors of the road which would insure his making the first page of every newspaper in the country, why did not Mr. McChord go farther and say what he meant by "an adequate system of superintendence and supervision"? The only adequate system known, involves the equipment of surprise checking. Did Mr. McChord mean that the New Haven should adopt a system of surprise checking? If he did, why did he not say so? Is it possible that the fact that the labor brotherhoods are known to be opposed to surprise checking prevented him from definitely recommending it? Is it possible that he has more regard for the sentiments and feelings of the "men higher up" in the labor brotherhoods that he has for the "men higher up" on the railroads? The commission repeatedly has betrayed more knowledge of the baleful influence of "wizards of finance" on railroad operation and safety than it has of the influence of labor leaders. Is this another example of the same sort? It is clear that the commission, if it is to assume its share of responsibility and perform its full duty regarding train accidents, needs some of the same tonic medicine which in this report Mr. McChord undertakes to administer to the "wizards of finance."

However, brushing aside these manifest shortcomings of the report, no one familiar with the truth as to this particular accident and the railway accident situation in general can read it without concluding that broadly and in the main its reasoning is based on facts, and that its conclusions are justified. It is the duty of the public and the authorities that regulate railways to let them earn enough and to leave their officers freedom of action enough to enable them to develop and operate the properties along safe lines. It is the duty of the public to pass and have enforced suitable laws to stop trespassing, which is the cause of more than one-half of all the fatalities on railways. But railway directors and operating officers have also a very heavy responsibility and duty. Those, whether "wizards of finance" or otherwise, who allow themselves to be elected to railway directorates assume the responsibility and duty of supervising the entire management of the railway with a view not only to causing profits to be earned for the stockholders, but still more with a view to causing efficient and safe service to be rendered. How are the directors to promote safe operation? Obviously, they cannot directly supervise the work of subordinate officers in the operating department or of employees. But they can and should study the accident figures of their railways as diligently as they study their financial figures, and they can and should select, promote and retire the higher officers even more with reference to the ability which they show to operate the railways safely than with reference to the ability which they show to operate them profitably. Their responsibility and duty in regard to safety is one which neither the directors of the New Haven nor the directors of most other railways have felt and lived up to.

As to railway operating officers, it is manifestly their duty all along the line, from the presidents down, to select, train, examine and discipline their subordinates with an eye, first of all, to promoting safety. This involves the most thorough and constant investigation and supervision. It requires, with the physical and labor conditions existing on the railways of the United States, the highest degree of energy, tact, patience and courage. Every accident which is caused by dereliction of duty on the part of an employee is an indication not only of a man failure on the part of the employee, but also of man failures on the part of his superiors. It is true, as Mr. McChord points out, that the employees have also their responsibility and duty. It is their duty to thoroughly familiarize themselves with the rules of the railway, to obey rules and orders implicitly and to exercise good judgment in emergencies. And it is the duty of their brotherhoods and grievance committees to discourage, instead of encouraging, carelessness, recklessness and insubordination. But the higher duty of exercising adequate superindence and supervision, and of administering just but strict discipline, is that of the officers. After all, the employees are likely to be chiefly what their superiors make them; and Mr. McChord is amply justified, in view of the evidence regarding the conditions on the New Haven, in concluding that the operating officers under the former management of that road had not been doing enough to maintain and improve discipline; and there is ample justification for concluding from the evidence regarding the causes of accidents on other railways that the officers of many other railroads also are not doing enough.

It is not sufficient, Mr. McChord indicates, for boards of directors to adopt good resolutions, or for officers to adopt proper rules and deliver general lectures or issue general circulars regarding the duties of employees. And he is right; these things are almost fruitless unless followed up with the detailed instruction, examination, training, checking and discipline which are necessary to insure that the employees know their duities, to ascertain whether they are performing them and to weed out of the service those who do not perform them.

It is essential not only to the safety of employees and the public, but also to the material welfare of the railways themselves, that railway managements and officers, from the directors down, should at once take hold of the accident problem and put forth far greater efforts than ever before to solve it. It is true that the accident situation is not growing relatively worse, as the public appears to think. It is growing relatively better. But the public does not know this. It sees the accident statistics of today and does not compare them with those of yesterday. Consequently, the agitation because of accidents grows in volume and strength; and the only way to deal effectively with it is to reduce the number of accidents. The terrific and irresistible onslaughts which the series of accidents on the New Haven brought down on its former management indicate the kind of attacks that may at any time be directed against any railway management which puts itself in an equally vulnerable position. While the present situation has its dangers, it has also its advantages. Public authorities are beginning to learn that man failures are the main cause of all accidents except those to trespassers, and are beginning to denounce railway managements for not exercising adequate discipline. This would seem to be a favorable time to take the steps necessary to improve discipline. The conditions appear to be ripe for an attack all along the line on the conditions which cause accidents, and it is to be hoped that such an attack will be made on every railway. If it is made not only with the object of punishing employees who are at fault, but also with the object of developing such a system of selecting, training, examining and supervising employees, as will reduce to a minimum the number of them who will make mistakes, it may confidently be expected that the attack will be effective.

NEW BOOKS.

Places of Pilgrimage for American Travelers. Published by the Great Western Railway Company of England.

This is an attractive pamphlet published by the Great Western Railway describing and illustrating a large number of the principal points of attraction in Great Britain for travelers from America. The booklet contains a map showing the principal points and a brief historical sketch in connection with each place. Some of the places described include the birthplaces of several of the early English discoverers or settlers of America and other persons whose lives have been intimately connected with the early history of this country.

Atlas of Railway Traffic Maps. By William Arthur Shelton, Instructor in Interstate Commerce, LaSalle Extension University. Size 10 in. x 12 in. Published by the LaSalle Extension University, Chicago. Buckram. Price $3.

This atlas is one of a series of text books on interstate commerce and railway traffic which is being prepared by the LaSalle Extension University. The series will form the basis of a new course of instruction by correspondence in interstate commerce and traffic management. The purpose of the atlas is to present comprehensive and accurate information concerning the freight rate territories throughout the United States on maps prepared for that purpose. The maps show in colors the classification territories, also the larger freight association and certain rate adjustment group territories, with a complete alphabetical index. The maps have been prepared from current territory directories, information and other circulars and tariffs, and have been carefully checked in several freight association offices, so that the information is as completely up to date as possible. They should be of great value to students of traffic and to shippers.

Resuscitation. By Dr. Charles A. Lauffer, medical director, Westinghouse Electric & Manufacturing Company. Bound in cloth. 47 pages. 4 in. x 6½ in. Illustrated. Published by John Wiley & Sons, New York. Price 50 cents.

This book includes a reprint of a paper on this subject delivered by the author before the Philadelphia section of the National Electric Light Association. After explaining a number of successful results which have been obtained by employing resuscitation methods on men who were supposedly dead, the book gives a clear description of the mechanism of respiration, illustrating it by a number of views of various parts of the anatomy. The Prone Pressure or Schaefer method of resuscitation which has been adopted by the National Electric Light Association and a number of other engineering societies is described in detail. It brings out in a clear, concise manner the necessity of people in general being versed in the principles of resuscitation and clearly shows how these principles can be learned so as to prove valuable to persons in ordinary walks of life.

Edward A. Moseley, The Life Work of. By James Morgan. New York: The Macmillan Company. Cloth, 378 pages. 5½ in. x 8½ in. Price $2.

For the last few years of Republican ascendancy in Congress one of the things most often heard of was the "steering committee," of the Senate, the group which really decided legislation, though it had no official authority or function. That term well describes Mr. Moseley's activities. For 20 years or more he was a self-appointed committee of one to steer to successful issue the safety appliance bills and other legislation designed to benefit railway trainmen. Mr. Morgan gives him full credit for originating these laws and getting them passed. The tedious work of instructing the uninformed Congressman and arousing the indifferent could perhaps be done by the legislative agents of the brotherhoods, but for the strategy which, in a hundrd emergencies, was necessary to avert defeat, the trainmen were indebted mainly to Moseley. His title was secretary of the Interstate Commerce Commission, but that was too tame a job for a man of his energetic, aggressive temperament, and his heart was with the labor unions. He never admitted defeat and he gained his object by sheer perseverance and singleness of purpose. The discouragments of long delays in Congress, which have been the death of innumerable meritorious measures, never baffled him for any great length of time, and he left a number of legislative schemes unfinished when he died, in 1911. Mr. Morgan is a skilful biographer, and as a glorification of his hero's public spirited labors the book must be adjudged a success. Moseley did rough work and often made use of rough means; but it will have to be admitted that in his main purpose he pursued a consistent course.

The first half dozen chapters of this biography make very interesting reading, for its subject had a varied and interesting career before he went from Massachusetts to Washington at the age of 40. It appears that President Cleveland would have made Mr. Moseley a member of the original commission, in 1887, had he not made it a rule never to appoint a Democrat from such a strong Republican state. But he gave the commission a hint to select Moseley as secretary. Thirty pages at the end of the book are filled with appreciations from friends.

The Railway Library for 1912. Compiled and edited by Slason Thompson, Director of the Bureau of Railway News and Statistics. Size 5 in. x 7 in. 467 pages. Cloth. Published by the author, Chicago. Price 50 cents.

This is the fourth edition of The Railway Library, the first of which was issued in 1909, and following the general scheme of its predecessors, it brings together selections from the noteworthy addresses and papers of the year relating to railway subjects. It opens with a brief excerpt from the special American Railway Edition of the London *Times,* followed by the valedictory of James J. Hill to the stockholders of the Great Northern. Railway rates and railway valuation occupy a prominent place in the book, and in addition to several articles which have appeared in the technical press, there is included in full the opinion of Justice Hughes of the Supreme Court in the Minnesota rate case.

The problem of safety in railway operation and service receives attention in several articles. Railway nationalization is discussed in the abstract, and also with reference to the concrete examples afforded by Australia and France. The remuneration and hours of railway employees in Germany and the United Kingdom are exhaustively treated, and the various phases of compulsory arbitration are set forth in an animated discussion in the "Societe d'Etudes Legislatives," Paris.

Articles relating to the accident situation on American railways include an article from the *Railway Age Gazette* on "Why Five Thousand Trespassers are Killed Yearly"; an article showing the classification of trespassers killed on railways by Frank V. Whiting, general claims attorney of the New York Central Lines, and an address on the work of the federal government in the prevention of railroad accidents by Commissioner McChord of the Interstate Commerce Commission. Other articles include "The Country's Need of Greater Railway Facilities," by James J. Hill; "Adequate Service and Facilities Obligatory," by C. A. Prouty of the Interstate Commerce Commission, and "Are We Ready for Industrial Co-operation?" by Fairfax Harrison, president of the Chicago, Indianapolis & Louisville. A description of the new passenger terminal of the New York Central is included to illustrate the enormous cost of modern terminals. For the purpose of comparison of conditions in this country there are a number of articles on foreign railways written by some of the leading authorities in the various countries, including "Government Railway Operation in France," by Paul Leroy-Beaulieu; "Average Pay of German Railway Servants," by Professor Lotz of Munich; "Earnings and Hours of English Railway Servants," from the Bulletin of the International Railway Congress.

Letters to the Editor.

WHAT TRAINMASTERS, YARDMASTERS, ETC., CAN DO TO INCREASE CAR EFFICIENCY.

CHICAGO, September 12, 1913.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

I am very glad to see from the evidence which you are printing that the question of getting more movement of our freight cars is a live one with our presidents, our general managers, and our superintendents, but I confess I should like to see something from the men who are really closer to the work. The most important fact which I realized when I was a general officer of a railroad was that I could not do anything absolutely by myself, and that the men "on the road" could do a great deal, and, indeed, were doing a great deal, without the help of the general officers.

The railway officers who have written you on this subject will be the first to agree that they are getting more movement out of their freight cars because they have the cordial co-operation of the men on the road—the trainmasters, yardmasters, agents and train men.

I would like to hear from the best men on the road what devices they are adopting to get more movement out of the cars. A good idea from one of them given the publicity of your columns will bring forth seed a thousand-fold.

E. H. DeGroot, Jr., is right in saying (in *Railway Age Gazette*, September 5, page 403) that a great deal can be done at local freight stations. There is not a freight agent who cannot help to better the movement by economizing in his orders for cars, by making sure the cars are loaded in time for the local, and in a hundred other ways.

Local train crews can help a great deal. I shall never forget the complete organization of a local switch crew on the Pennsylvania Railroad some thirty years ago, with which I had the honor of being temporarily connected. The conductor of that crew knew the location of the switches at each station thoroughly, and gave specific orders to each member of his crew before approaching a station, so that the work was done with remarkable efficiency. Not only did this conductor give his orders clearly and ahead of time, but he insisted on getting his own orders in such definite shape that he, himself, knew exactly what was to be done at each station before he approached it. That crew earned thousands of dollars a year by its efficiency in getting more movement out of cars.

The road foreman, supervisors and section hands can help get more movement out of cars, not only by insuring the cars a perfect highway, but by doing their work so that the ordinary movement will be interfered with as little as possible.

The master mechanic and roundhouse foremen can help, not only by seeing that the equipment is in good shape, but by seeing that it is put in good shape without fail when it is needed.

Probably the yardmaster can help most. A good yardmaster knows that a yard is a place to get cars out of, while a poor yardmaster thinks of it as a place to get cars into. I would like to know how the best yardmaster manages to get cars through his yard quicker this year than he did last. He must have a thousand devices, while I only know a few, that would help the situation if adopted by other yardmasters of less experience.

Of course the train despatchers can help, especially those train despatchers who distribute cars at local stations. Some of them could tell us how they so arrange it that cars shall reach the points where they are needed exactly when they are needed, and are moved again immediately after loading.

The trainmaster could tell us how he co-ordinates the work of his dispatchers, his yardmasters, his train crews, and his agents.

Letters of this kind would, perhaps, not be as well rounded out as those that have been written to you, but to my mind they would be of more value, and hints as to improvements from these men on the firing line would help the others who are actually engaged in the work of getting more movement out of freight cars.

A. HALE,
General Agent, American Railway Association.

TRAINMEN SHOULD HAVE HOMES AT TERMINALS.

CHICAGO, Ill., September 18, 1913.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

In the reports as to the recent accident at North Haven, Conn., I notice that Engineer Miller had actually been getting very little real rest on account of deadheading back and forth between Stamford and New Haven during his hours off duty, his home being near New Haven and his run starting from Stamford. While this may have had nothing whatever to do with this particular accident, there is no doubt that an engineer—or any other employee connected with the operation of trains—needs at least the amount of sleep and rest prescribed by the laws of nature in order to be in sufficiently good mental and physical condition to be entrusted with the care of a railroad train. In the case of a night run when it is natural to sleep, adequate sleep and rest is all the more important.

In Miller's case there seems to have been ample time to have secured sufficient sleep had he lived at Stamford, but his home being near New Haven he naturally elected to go home, the result being that in the 24 hours prior to the accident he actually secured about three hours' *real* sleep—I hardly see how he could have gotten more.

Is it not an entirely reasonable proposition that a man should live where his work is? In the case of a man in train service assigned to a regular run should he not be required to live where the long layover is and where he can secure proper rest? It does not seem that any reasonable and fair minded man or body of men could consistently oppose such a requirement. The officers of the railroads, being semi-public officials, should see that this is done, as both the railroads and the men have a duty to the public to perform in seeing that all men put in charge of trains are in first class condition, both physically and mentally. The railroads should first see that the different runs are so arranged as to be as comfortable as they can be made under the conditions as they exist, and the men accepting such assigned runs should be required to live where they can secure natural rest. This may present some difficulties on roads which run a large number of additional passenger trains during certain seasons of the year, but such difficulties could and should be overcome.

On one of our western roads recently a superintendent found that some of his men assigned to way freight service were living at the opposite end of the run from where they arrived Saturday night, the result being that they were riding both Saturday and Sunday nights in order to be home Sunday and return to the starting point of their run Monday morning. This practice was promptly stopped, with beneficial results.

EMPLOYEE.

RAILWAY ACCIDENTS IN THE UNITED KINGDOM.—According to returns made to the British board of trade, 284 persons were killed and 2,457 injured on railways in the United Kingdom during the first three months of this year—an increase of 39 killed and 268 injured on the record for the corresponding quarter of 1912.

NIGERIAN RAILWAYS.—The sanction of the Imperial Government has been given to the details of an important railway scheme for the further development of Nigeria. The terminal point of the line, which will be some 400 miles in length, and will probably take three years to construct, has been fixed at Ignooha, at the head of the Bonny estuary. Construction on the new line will be started without delay and pushed forward as rapidly as possible.

DOUBLE DECK BASCULE BRIDGE.

The Problem of Building a Double Deck Bascule Bridge Solved Without Adding a Single Extra Detail or Joint.

The bascule bridge recently completed by the Canadian Pacific over the Kaministiquia river at Fort William, Ont., to reach the coal dock and piers on Island No. 1, is the first double deck bascule bridge in the world. It is a single leaf Strauss trunnion bascule structure carrying a double track railway on the lower deck and a 29-ft. highway and two electric railway tracks on the upper deck. It consists of a 186-ft. river or movable span, pin-connected at the main trunnion T. Fig. 2, and resting on an ordinary truss shoe on the rest pier R. The details and the general arrangement of

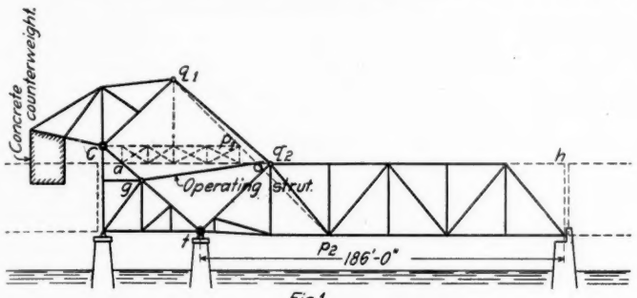


Fig. 1.

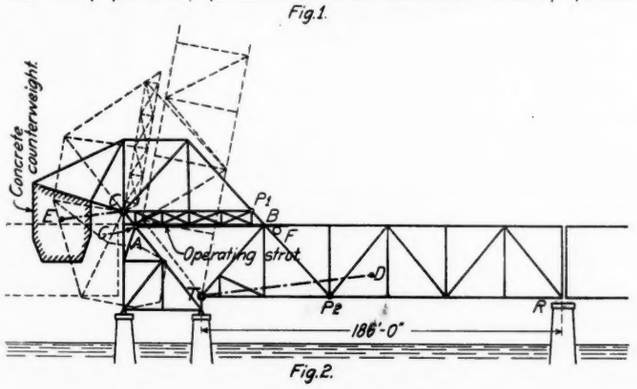


Fig. 2.

Figs. 1 and 2—Diagrams of Calumet River and Kaminustiquia River Bridges.

trusses, floor system, bracing, etc., conform with standard practice in the design of stationary bridges for similar service. It further consists of a 40-ft. tower span having four triangular trusses, two in line with the bascule trusses and two placed 15 ft. outside of these, the tower trusses being surmounted by four counterweight trusses, pin-connected to the tower trusses at C, which support two concrete counterweights, so placed as to permit the traffic on the upper deck of the approach span to pass between them. On account of the limited space in which to place the counterweights, iron ore was used in the concrete, of which the counterweights were made, to secure as great a density as possible. The resulting concrete weighs about 175 lbs. per cu. yd. The four tower trusses as well as the four counterweight trusses are thoroughly braced transversely by means of cross braces and portal struts.

From A to B the inside counterweight trusses carry the floor system of the upper deck, while the counterweight trusses are connected to the bascule span by means of two structural steel "links" P1-P2, placed in a transverse direction centrally between each pair of counterweight trusses on both sides of the bridge, connecting a pin at P1 to a cantilever pin of large proportions at P2.

It will be noted that the four pins, T, C, P1 and P2, are located in the corners of a parallelogram, and this remains true for any angle of opening of the bridge, insuring that the angular movement of the counterweight is equal to that of the movable span, which, as will easily be seen, is the only necessary condition for perfect balancing in all positions, if the bridge be perfectly balanced when closed, and if a line T D from the main trunnion to the center of gravity of the movable span be parallel to a line C E from the counterweight trunnion to the center of gravity of the counterweight (including counterweight trusses, etc.), due allowance being made for the weight of the links and the operating struts. If these conditions are fulfilled, the composite center of gravity of the entire structure will not move either vertically or horizontally as the bridge goes up and will always fall between the two tower piers. It will thus be seen that the dead load reactions on these piers remain vertical and constant at all times, which is one of the characteristics of the Strauss bridge.

The bridge is operated by two 85-h. p. General Electric motors "ITC 5014," which are located on the movable span under the highway floor at F, and are controlled from the operator's house, which is supported on the tower. They operate a train of ordinary spur gears, which terminate in

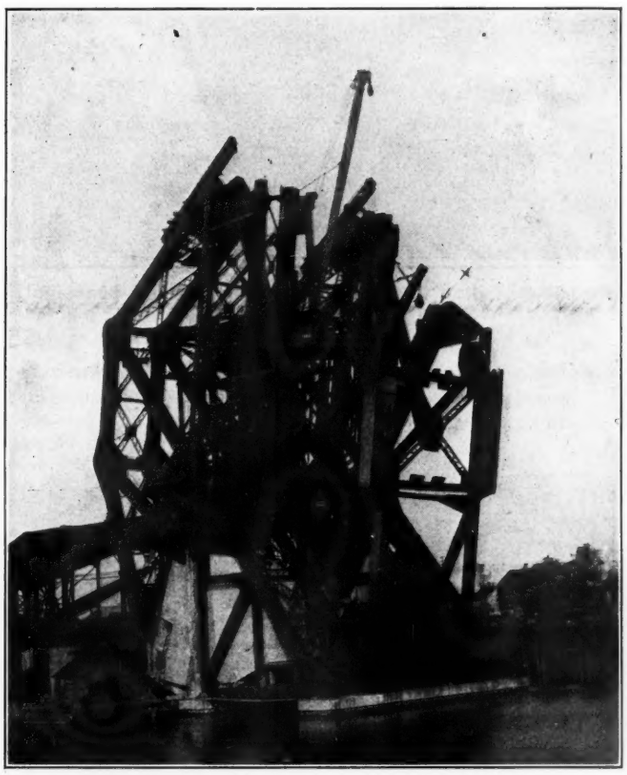


Fig. 3—Erecting Double Deck Bascule Bridge in Open Position.

two steel pinions, which in turn engage cast steel racks bolted to the underside of two structural steel operating struts, which are pin-connected to the tower at G. It will thus be seen that the movable span, so to speak, operates itself, but in later designs the machinery is often placed in the tower and the conditions reversed, which has several advantages, although the former arrangement is equally efficient as far as the operation of the bridge is concerned. The total weight of steel in the bridge, exclusive of approaches, is about 2,500 tons and the counterweights weigh about 2,400 tons.

Fig. 3 shows a photograph of the bridge during construc-

tion, and it will be noted that the bridge is being erected in the open position so as not to interfere with river traffic, a procedure which is common in work of this kind, and which has proved to offer no particular difficulty, but rather to be

Fig. 5—Canadian Pacific Double Deck Bascule Span in Open Position.

economical and convenient. In this view the first two panels of the movable span are erected, one of the concrete counterweights and one of the counterweight links have been completed, and the holes in the bascule truss and in the link for the lower pin (P2) can readily be seen.

It is interesting to note that the problem of building a double deck bascule which at first would seem impossible without one floor fouling the other, or without placing the break in the floor back of the point of rotation, has here been solved in such a manner that the structure does not contain a single extra detail or joint as compared with the standard heel trunnion design. The evolution from the ordinary single deck railway bridge to the double deck structure has been indicated in Figs. 1 and 2, which show to correct scale skeleton drawings of the Chicago & Western Indiana Calumet river bascule and of the Kaministiquia river bridge.

Both bridges have movable spans of 186 ft. and it will be noted that by adding the members indicated in dotted lines in Fig. 1 by moving the "link" from q1-q2 to p1-p2, and by placing an additional deck on top of the movable span from q2 to h and at the bottom chord of the extended counterweight trusses from a to q2, the bridge is changed from a single deck to a double deck structure, operating as a unit, and identical in principle with the single deck bridge in every respect. The most important difference lies in the dividing of the counterweight into two separate halves and the placing of these outside the bascule trusses, as referred to above, but this has been done also in a few single deck structures in order to keep the tower and the counterweight low, and is therefore not peculiar to the double deck bridge.

The type of the Kaministiquia river bridge and the general lines of the structure were determined by C. N. Monsarrat, former bridge engineer of the Canadian Pacific, while the drawings have been prepared under the direction of the present bridge engineer, P. B. Motley. The design was worked out and the general detail drawings were prepared by the Strauss Bascule Bridge Company, of Chicago. It was fabricated and erected by the Canada Foundry Company, Ltd., Toronto, Ont.

New Freight Cars for India.—During the quarter ended March 31 last the number of new freight cars put on the line by the principal railways was as follows: East Indian, 333; North-Western State, 220; Bombay, Baroda & Central India, 194; Bengal-Nagpur, 150; Great Indian Peninsula, 109; South Indian, 70; Eastern Bengal State, 48—all 5 ft. 6 in. gage; and the Bengal & North-Western put in service 754 new 3 ft. 3 in. gage freight cars.

Fig. 4—New Double Deck Strauss Bascule Span over Kaministiquia River.

SOCIETY OF RAILWAY FINANCIAL OFFICERS.

Security Market Conditions, Voucher Forms, Clearing House Settlements and Semi-Monthly Payment Discussed at Meeting.

The seventh annual meeting of the Society of Railway Financial Officers was held at the Hotel Moraine, Highland Park, Ill., on September 23, 24 and 25, and was attended by 41 members. The meeting was called to order on Tuesday afternoon by President T. H. B. McKnight, treasurer of the Pennsylvania Lines West of Pittsburgh.

PRESIDENT'S ADDRESS.

Mr. McKnight presented the annual address of the president, reviewing the principal events of the past year, and dwelling particularly on the increasing difficulty that railways have found in borrowing money at reasonable rates for refunding obligations, and for new capital expenditures until companies whose credit is unexcelled are borrowing money at 5, 5½ and even 6 per cent. Among the reasons for this condition he mentioned the reduction in the saving power of the people, owing to the high cost of living and the higher standard of living, vast increases in the amount of bonds issued by railways to provide for increased business, increases in the number of corporations issuing securities, and the new obligations poured out by states, counties and cities for all manner of improvements, the increase in interurban and city electric lines, electric plants, etc. Manufacturing corporations of all kinds, he said, from small companies to the trusts, vie with each other in flooding the market with their mortgage obligations. The result of all this borrowing means that bonds are sold by agents like life insurance, each offering a more attractive investment than the other until the low-rate but well-secured railroad bond has no chance at the market. He also mentioned the war in the Balkans and the mobilization in all European countries which have lessened the market abroad for American securities, the evident hostility in legislative bodies to railways, and the decreased value of gold. Short term notes recently issued by the railroads have decreased the market for long time securities.

Regarding the plan for the establishment of a general railway clearing house which was recommended by the executive committee last year, he said that the local clearing house established at Chicago during the year as an experiment has now been in operation for such a time as to prove the practicability of clearing adjusted balances, and it will soon be time to take up the subject again with the accounting officers with a view of getting a general railway clearing house established. He believed the accounting officers were now prepared to favor the plan whenever it appears advisable.

CLEARING HOUSE SETTLEMENTS.

Secretary Carl Nyquist, assistant secretary of the Chicago, Rock Island & Pacific, presented the report of the secretary and treasurer, showing that the financial affairs of the association are in a favorable condition, and that the membership stands the same as it was last year, 118 members, resignations and deaths having been offset by new members. He then presented the report of the executive committee outlining the progress made during the year in carrying out the recommendation of last year's committee, looking to the establishment of a general railway clearing house. Sub-committees of six members each, representing the financial officers and the Association of American Railway Accounting Officers, had conferred on the subject and unanimously adopted a resolution favoring the principle of clearing house settlement for all agreed balances, and recommending that the plan be tried out by railways having headquarters at Chicago, in order that the experience thus gained might be used in determining the practicability of organizing a general clearing house. The present Chicago clearing house is settling ticket and per diem balances for seven roads, and is working satisfactorily. There is no expense connected with it, as each road reports its balance monthly to the chairman, who makes the necessary computations, and advises the treasurer of the road which he represents (at present the Chicago, Rock Island & Pacific), who acts as treasurer of the clearing house and draws for all debit balances, advising all creditors to draw on his road. In other words, the accounting and cash for all roads in the local clearing house are handled practically as the business of the road acting as chairman. The scheme is very simple and could readily be extended to cover freight balances when the roads agree to it.

FORMS OF VOUCHERS.

J. G. Stidger, treasurer of the Wheeling & Lake Erie, presented a progress report of the committee on forms of vouchers and agents' drafts. Letters have been sent to each member of the association and to a large number of other roads asking for samples of their voucher forms, and inquiring as to whether they had adopted the standard form recommended by a previous committee, to be negotiable, in the form of a straight check or draft, on which the endorsement of the payee is the only receipt required, of a standard size, 3½ by 8½ in. The replies, while not complete, showed that many roads have adopted forms similar to that recommended. Variations from this form were discussed in the report, and it was stated that those roads which had adopted the standard have found it a great time-saver, particularly for the reason that it does not permit the clerks to copy so much information from the bills. A committee of the American Bankers' Association had objected to any form of folded voucher because of the chance of mislaying small checks between the folds. While railways cannot use the small form for all of their business the committee believed it to be adapted for over 80 per cent. of their business.

The report brought out a lively discussion, which showed that several roads have found the uniform small voucher suitable for from 80 to 98 per cent. of their business. No information was presented as to the number of companies that have adopted it, but one member reported that 80 roads with which his company deals are using it, and that a bank president had told him the voucher check was becoming so popular he was considering getting up a form to recommend to his customers. Another member pointed out that this form obviated the necessity of depending on a clerk to properly match the checks with vouchers ready for signature. A resolution was adopted reaffirming the previous recommendation of the standard form.

PAYMENT OF DRAFTS.

The secretary read a paper by R. R. Reed, assistant treasurer, Pennsylvania Lines, on "An Efficient and Satisfactory Method of Payment of Drafts by Drawees." Previous to 1904 there was a continuous stream of drafts being presented by various banks to the treasury departments of the various subsidiary companies of the Pennsylvania system throughout the day. In that year a plan was adopted by which one bank would accept each morning at the clearing house all drafts drawn upon the various treasury department offices of the Pennsylvania Lines, amounting to 500 or 600 a day. The drafts were listed on an adding machine and taken to the treasuries by 11 a. m. They were there checked and those requiring approval by the accounting department were checked at once by representatives of that department, and checks for the total amounts were drawn by the various cashiers of the subsidiary companies for all drafts which had been accepted and were to be paid, the checks being delivered to the bank by 3 p. m. This plan has resulted in a great saving of time and requires only one check each day for each company in the system.

The discussion on this paper showed that similar methods are

practiced in many large cities, but that the New York banks are not willing to adopt it. In one city the clearing house charges all drafts to one bank and the road gives one check for the entire amount.

S. L. Shannon, treasurer and comptroller of the Canadian government railways, read a paper discussing some phases of the financial affairs of those roads. All revenue collected goes into the public treasury, and is not drawn on directly for the expenses of operating the roads. Parliament appropriates annually the amount necessary for operation, as well as that required for capital account. The Canadian government, the provinces and the municipalities have made free gifts to aid in the construction of railways, amounting to $131,256,136, up to the end of the fiscal year 1912, in addition to $285,423,555, representing the cost of railways constructed or under construction by the government.

D. K. Kellogg, treasurer, Richmond, Fredericksburg & Potomac, presented a paper on "Why Should State and Federal Governments Be Liberal in the Treatment of Railroads?"

CASH BOOK SYSTEMS.

John E. Murphy, treasurer of the Chicago & Western Indiana, read a paper describing a plan recently adopted by his road for furnishing cash book information to the auditor. This consists of a loose leaf cash book in which entries are made by typewriter and a carbon copy is furnished to the auditor so that the original book need not leave the treasurer's office. He also described a new form of negotiable time certificate, called a department pay roll draft, which is used for the payment of employees leaving the company.

The paper aroused an interesting discussion on various methods of cash book procedure and particularly on the advisability of using loose leaf books. It appeared that ten roads of those present use the loose leaf system for cash books, but others doubted their legality if required to be produced as evidence in court. A resolution was adopted providing for the appointment of a committee of three to inquire into the advisability and legality of loose leaf systems for all treasurers' records, to report at the next meeting. The president appointed on this committee W. Hodson, assistant treasurer, Chicago, Rock Island & Pacific; R. P. Ahrens, local treasurer and assistant secretary, Lake Shore & Michigan Southern, and John E. Murphy, treasurer, Chicago & Western Indiana. The discussion on the time certificate showed that many of the treasurers preferred a non-negotiable order for discharged employees.

SEMI-MONTHLY PAY LAWS.

R. W. Morrison, assistant to the treasurer of the Pennsylvania Lines, presented the following paper on "Semi-Monthly Pay Laws."

The legislatures of a number of states last winter enacted laws requiring individuals, firms and corporations to pay their employees twice each month.

The bills requiring this frequent payment were advocated and pressed by representatives of organized labor, although in some states the impression prevailed that the merchants' associations were also aiding the measure. Careful investigation failed to show, however, that they were, at least openly, taking any part in the movement.

Public hearings were held to consider the bills, and the railroad companies were represented and made a vigorous fight to defeat the measures, but they did not receive assistance from other corporations. Although the only advocates of the measure appearing before the committees were the representatives of organized labor, the arguments of the railroad companies were attacked not alone by the representatives of organized labor, but also by members of the committees themselves.

The principal reasons given by the advocates of the bill were: First, that it would reduce the high cost of living, as the employees, by receiving their money twice a month, could pay cash for what they purchased, and thereby receive more for their money. Second, that the employee would not be compelled to go to the loan sharks when he wanted money. Third, that it would compel roads to pay more promptly, as under the monthly pay system a number of roads did not pay until the twentieth or twenty-fifth of the month the wages earned in the previous month, and that there was no reason for it except that the roads were getting interest on the money which belonged to the employees.

The representatives of the railroads argued that as all credit was on a 30 day basis, there would be no advantage to the employee, and that the plan would have a tendency to make the employee improvident; that the additional cost of paying twice a month would be increasing the burden of the railroads and that there would not be a corresponding benefit to any one.

The laws, however, were passed in many states.

The provisions of the laws are similar in most of the states. They agree on the division of the month, the first to the fifteenth inclusive, as the first half, and the sixteenth to the last day inclusive, the last half. There is, however, a difference in the time when payments are to be made, and some states have prescribed the medium to be used.

New York requires payment twice each month in *cash*.

Pennsylvania requires that unless otherwise stipulated in the contract of hiring all employees other than those receiving an annual salary, shall be paid semi-monthly.

Ohio requires all employers who shall employ four or more regular employees to pay employees semi-monthly; provided, however, that if an employee shall be absent from his regular place of labor and does not receive his wages through a duly authorized representative, he shall be entitled to payment at any time thereafter upon demand upon the proper paymaster at the place where such wages are usually paid and where such pay is due.

Indiana requires payment to employee between the first and tenth, and between the fifteenth and twenty-fifth of each month, all wages earned to a date not more than ten days prior to the date of such payment.

Illinois requires that every corporation for pecuniary profit engaged in any enterprise shall pay as often as semi-monthly to every employee all wages earned to a day not more than eighteen days prior to the date of such payment; provided that if an employee is absent at the time fixed for payment or for any other reason is not paid at that time, he shall be paid thereafter at any time upon six days demand.

Michigan requires persons or firms engaged in manufacturing, corporations, contractors and others, to pay their employees semi-monthly; any employee leaving his employment between the dates of any established pay-day, shall be paid the wages due at the time of leaving, or the next regular pay day, but any employee discharged or absent on such regular pay day, shall be paid forthwith after demand, as soon as the amount due can with the utmost diligence be ascertained, provided, that the mailing of a check upon or before the regular pay-day shall be deemed to be a compliance with the act.

Missouri requires that all corporations employing mechanics, laborers or other servants, shall pay the wages of such employees as often as semi-monthly.

When the semi-monthly pay laws were enacted it at once became evident that it would be necessary to use every means possible to assemble the time and prepare the pay rolls more promptly, to enable checks to be drawn and forwarded for delivery within the time allowed, or to make payments in cash where that medium was used. As the work was practically doubled it became necessary to increase the timekeeping force as well as the force for preparing and delivering the checks or cash, thereby increasing the expenses of the railroad company. And this increase of expense apparently gave the members of the legislatures not the least concern.

No doubt every treasurer has experienced more or less trouble by delays in receiving the pay rolls from the accounting

department, owing to the fact that a force necessary to take care of the ordinary business is not sufficient to take care of the overflow which comes with the pay rolls, so that with payments twice a month these troubles are doubled.

There are two solutions of this problem: one is to have a floating force which can be drawn from other offices at pay roll time to assist in getting the rolls through the auditor's office promptly. This has its objections, owing to the fact that it causes congestion in one office, but this may not be so objectionable when checks are to be drawn after the rolls reach the treasurer. It is a serious objection when payments are to be made in cash.

The other plan is to have the accounting department send men to the important points to audit the rolls as they are prepared and turn them over to the paymaster for payment.

At terminal points there are a great many rolls, such as those for shops, freight stations and yards, that can be prepared before the time slips of the trainmen are received, and these can be delivered to the paymaster for payment on the third business day, other rolls to follow as they are completed, so that it is possible without much effort to have all rolls in the paymaster's hands by the fifth business day.

The preparation of trainmen's rolls are the most difficult, owing to the various rates of pay and overtime, but a great deal of the delay caused by having to make all the calculations after the time is placed on the check roll can be obviated by using a time report on which is calculated each day the earnings of the employee for the trip and overtime, the amount to be entered on a wage sheet.

The wage sheet is ruled horizontally for the days of the month, and vertically for the employee whose name appears at the top of the column, so that closing the rolls becomes a question of addition which must be done by the old method, so that the time saved is that which is required to make the calculations of the various trips by the rate.

My experience with the semi-monthly pay is limited to a short period, but if the expressions of disapproval we hear from the employees mean anything, I am inclined to the opinion that the advocates of the law were wrong in their ideas of the benefits they would receive and the railroad companies more nearly right in their prediction of the results.

A. B. Jones, local treasurer, Chicago & North Western, presented a short paper on the same subject.

In the discussion that followed several members related their experiences before the legislative committees in opposing the semi-monthly pay laws, and told how the laws have increased the working expense in their departments. It was brought out that one company had found it cost an average of 20 cents to pay a man once a month, and that the additional cost to pay him twice a month was about 12 cents. In most cases the paymaster's forces had been doubled and additional forces had been required in other departments. Some roads had adopted the semi-monthly pay day all over the system as soon as the laws had been passed in one or two states, and had kept the expenses from being doubled by systematizing their arrangements for paying the men. One company makes out its pay rolls in duplicate by the use of carbon paper, printing an extra column on the second sheet for the second half of the month, so that the only additional work in making out the pay roll for the second two weeks is in filling in the amount, the name and other information having been written at the time the roll was made up for the first two weeks. Several members believed that the length of time required on some roads in the past, to pay the men after the expiration of the month, was partly responsible for the agitation for semi-monthly pay laws, and while many declared that the railways may as well prepare to have such laws passed in all states, and to meet the conditions that will be imposed, a large number thought that the majority of the men do not want to be paid semi-monthly, and that the passage of the bills was almost entirely due to labor leaders and legislators who wanted to pass laws they thought would be popular with the employees. On one road the date of payment was changed from the 20th to the 15th of the month, and the men seem to be satisfied, and no state through which this road passes has enacted such a law. Several members opposed the laws not only on the ground of increased expense to the railway, but because they believed the men were better off under the monthly system of payment, on the ground that all credit is on the 30-day basis, and that a monthly payment system tended to cultivate relations with the banks.

Frank J. Loesch, local attorney of the Pennsylvania Lines in Chicago, presented a paper on "Railroads from a Legal Aspect," which will be printed in these columns next week.

SECURITY MARKET CONDITIONS.

The secretary read a paper by J. V. McNeal, fourth vice-president and treasurer, Baltimore & Ohio, on "Present Condition of the Security Market, Its Cause, Effect and Probable Duration." After discussing various causes for what he termed the "crisis of 1913," he said "nothing to my mind encourages the contemplation of a reduction in the rate of interest on property such as we are concerned in, or the securities issued for their development, as long as they are fair targets for taxation, and so long as they suffer from this high cost of living, but are restrained from participating in the defenses against it enjoyed by all others. It may be possible, and no doubt is, that great improvements could be made in the management and operation of these properties. I know of no phase of humanity that could not be improved, but this very attitude of the law making and law administering power toward these railways is repellent to the investors seeking their securities rather than encouraging to them. I am not without faith that this condition will give way to something that will permit the railways to earn such a wage in the way of interest returns to those holding their shares as will permit them to meet the public desire in all respects as public utilities should."

The secretary also read a paper by Frank Scott, treasurer of the Grand Trunk, on "The Financial Situation in Canada."

An interesting discussion ensued on the condition of the security market. Various reasons for this condition were assigned, chief among them being that other industries and public works are absorbing large amounts of capital, at rates far beyond what the railways can afford to pay and with almost equally good security. Many thought that there is a present tendency toward improvement, and it was stated that the railways are only awaiting more favorable conditions to seek large amounts of new capital for improvements.

No formal report was presented on the question of clearing house settlements. Mr. Hodson added some information to that contained in the report of the executive committee on the working of the local clearing house at Chicago, in which the Atchison, Topeka & Santa Fe, Chicago & Alton, Chicago, Burlington & Quincy, Chicago Great Western, Chicago, Indianapolis & Louisville, Chicago, Rock Island & Pacific and Illinois Central are the members. The accounting departments furnish the figures and the chairman makes up drafts on the different roads. When paid these amounts are taken into the cash, the other roads are notified and they draw on the Rock Island through the banks. After discussion a resolution was adopted as follows:

Resolved, that we reaffirm our belief in the clearing house scheme and desire the full establishment of a general railway clearing house as soon as it can be brought about, and urge the executive committee to proceed in the matter at its discretion.

A discussion of questions in the question box concluded the Wednesday session, and on Thursday morning the election of officers was held, which resulted as follows: President, George A. Walker, assistant treasurer, Pennsylvania Railroad, Philadelphia; first vice-president, John E. Murphy, treasurer, Chicago & Western Indiana, Chicago; second vice-president, D. K. Kellogg, treasurer, Richmond, Fredericksburg & Potomac; secretary and treasurer, Carl Nyquist, assistant secretary, Chicago, Rock

Island & Pacific (re-elected). New members of the executive committee: J. G. Stidger, treasurer, Wheeling & Lake Erie, Cleveland; George A. Walker, John E. Murphy, E. H. Alden, secretary and assistant treasurer, Norfolk & Western, Philadelphia, Pa., and D. K. Kellogg.

A resolution was also adopted at this session providing for the appointment of a committee to endeavor to increase the membership and the attendance at meetings.

The entertainment program included an informal tea at the Skokie Country Club and an automobile ride to the United States Naval Training Station for ladies and guests; and for members and guests, on Tuesday evening dancing and cards; on Wednesday evening a dinner, reading and music, and on Thursday afternoon and evening an automobile ride through Chicago's parks and boulevards, and a theater party.

PROGRESS IN THE FEDERAL VALUATION OF RAILWAYS.

Substantial progress is being made by the Board of Engineers of the Interstate Commerce Commission in charge of the federal valuation of railways and the committee of 15 engineers representing the railways in arranging many of the preliminary details with reference to this proposed work. These two bodies have been in frequent session throughout the summer and are reaching a common understanding on many important matters. The practice of the Board of Engineers now is to endeavor to decide many of the fundamental rules of practice with the committee of railway engineers.

The question which has been the subject of the most controversy up to the present time has been that of the preparation of maps and profiles for the use of the commission's engineers. Tentative specifications for maps and profiles were issued by the Interstate Commerce Commission at the suggestion of the Board of Engineers about August 10. These specifications provided in brief that drawings should be divided between right of way and track maps, station maps and profiles. All maps and profiles are to be made on the best grade of tracing cloth. The right of way and track maps are to be made in sheets 24 in. by 56 in. on the scale of 1 in. equals 400 ft. Station maps to a larger scale are required wherever sufficient information cannot be clearly shown on the right of way and track maps. In large cities the station map is to be made in two sections, one showing details regarding land and the other regarding track and structures. Station maps are to be made on the same size sheets as the right of way map and on the scale of 1 in. equals 100 ft. Profiles shall be made on sheets 12 in. by 56 in., to a vertical scale of 1 in. to 20 ft. and horizontally 1 in. to 400 ft.

These specifications require that the right of way maps show the width of right of way, a schedule of the grantor and grantee of the property, with a complete record of its filing, the property lines of adjacent land owners, the section and quarter section lines for a distance of one mile on each side of the center line of the railway, the alinement, tracks and other improvements on the right of way. The same data in greater detail are to be shown on station maps.

On profiles the vertical projection of the original ground surface on the center line of the railway is to be shown with the present grade line, including data regarding the rates of grade and elevation. All bridges and openings in the track are to be shown in vertical projection with data showing the average depth of penetration of the piling in each bent of trestles and the character and depth of the foundation of masonry structures. All quantities of clearing, grubbing, grading and classification of same, overhaul, masonry, timber in wooden bridges, weights of steel bridges, etc., are required as well as the alinement of the main track, location of passing tracks, etc.

The railways were given until September 1 to file objections to these specifications, with the Interstate Commerce Commission and the committee of engineers prepared objections which were accordingly filed. The matter is now in the hands of the Interstate Commerce Commission for final action and it is expected that a decision will be given in the near future.

The railways objected especially to the requirement of the specifications that new maps should be furnished without making investigation of the records now possessed by the railways, as they did not feel that they should be put to great expense to prepare duplicate maps on a slightly different form where this information has in many cases already been prepared for a similar purpose. This is especially true in the west where a number of roads have prepared such information for various state valuations. The railways have not objected to the preparation of such information in accordance with the standard plans outlined by the commission wherever such information has not previously been collected and new maps are necessary, but do not feel that they should be put to the expense of redrawing all these maps for the sake of uniformity alone. From data collected by one of the railways of California when preparing maps similar to those specified, this additional expense will exceed $20 per mile of line or over $5,000,000 for the entire country.

The railways also objected to furnishing information regarding the property lines and names of owners of property beyond their right of way lines, as they have no means of accurately securing this information, and further believe that this is beyond the limits of the valuation act passed by Congress. They also feel that they should not be required to prepare original tracings to file with the commission. As outlined above, many roads already have this information prepared on tracings and can readily furnish the Board of Engineers with blue or white prints and vandykes. Under these conditions they feel that it is an unnecessary expense to be required to make additional tracings. Furthermore, the expense of revising these records to bring them up to date from time to time is correspondingly increased. Throughout the entire discussion the railways have felt that they should not be burdened with the expense of furnishing any information not necessary to the investigation and determination of values, and that they should not bear the cost of preparing and maintaining the records and files of the commission in support of this valuation.

It is now expected that the actual valuation work will be undertaken to a limited degree in the south about the first of the year. It has been tentatively decided that where the railways have already made an inventory of their property the government shall proceed with its valuation work by sending a party over the line to carefully check the data furnished by the railway. The railway will provide an engineer to accompany this party and to provide any further information. Where no valuation has been made by the railway, the method of procedure has not been fully decided on.

The entire country has been divided into five districts, each under the general supervision of one of the five members of the Board of Engineers, who will have as his assistant in direct charge of the work in his territory, a district engineer. While each member of the board will devote the greater portion of his time to the work in his own district, he will act with the other members of the board on any questions of importance.

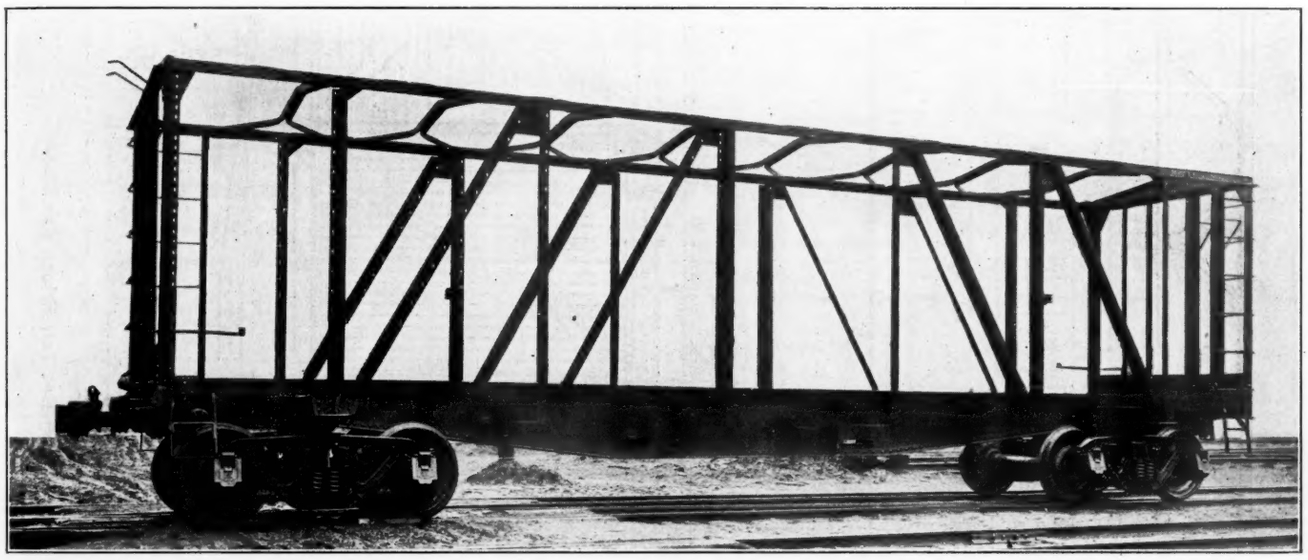
Pig-Pen Coaches in India.—A correspondent of the Allahabad *Pioneer* is exceedingly wroth with the North-Western Railway on account of the dirty state in which he found the first-class coaches on the section of the line, Lala Musa-Rundian-Mahmud Kot. "We suppose ourselves," he writes, "to be ahead of the Chinese, at least in the matter of railways. I assure you, sir, the Chinese would hardly put their pigs into conveyances such as I have described, and my excuse for so long a letter is that I object to being treated worse than a Chinese pig."

STEEL FRAME BOX CARS FOR THE FRISCO.

Designed to Be Water-Proof, Burglar-Proof, Grain-Leakage-Proof and to Protect the Lading from Damage.

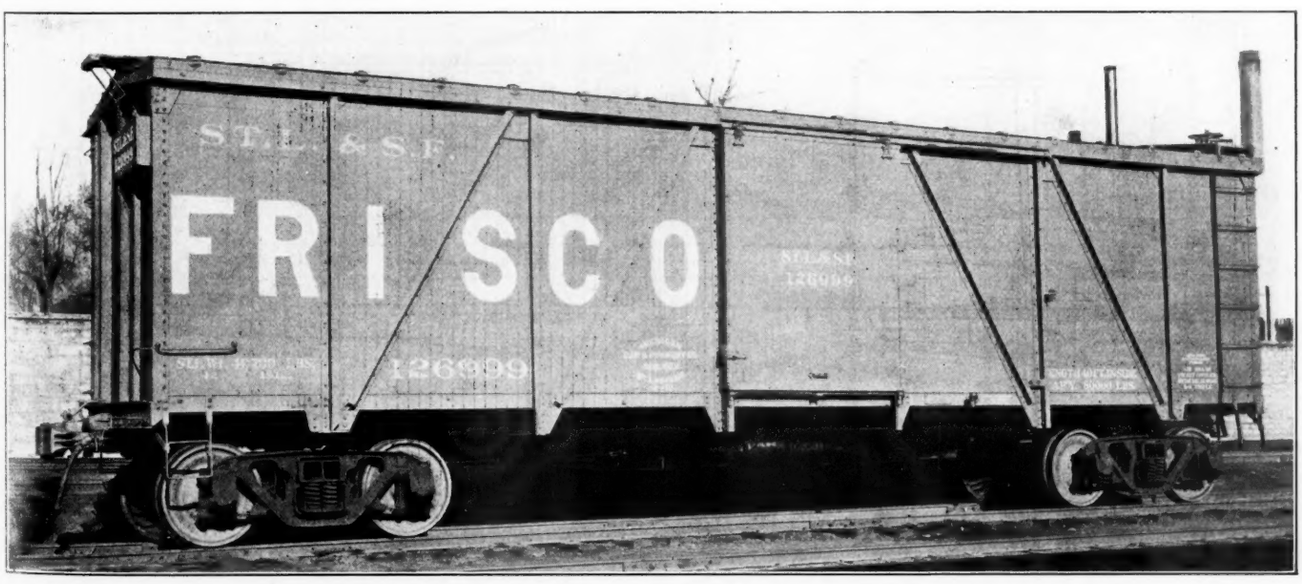
Few roads have given as much attention to the damage to freight, and the resulting freight claims, caused by the use of defective cars as has the St. Louis & San Francisco. In the first of a series of articles on "Defective Box Cars and Damaged Freight," *Railway Age Gazette*, April 12, 1912, page 835, statistics were given which showed that for the year ending June 30, 1911, the damage to freight which could be directly traced to defective cars on the Frisco amounted to $43,160.09, or 8½ per cent. of the amount paid out for damage and loss to freight on that road. In designing the last order of 1,000 box cars that road has given special attention to making the cars burglar, water and grain leakage proof, as well as providing a smooth style of interior construction, with a view to reducing to a minimum the destruction or injury to package freight in paper bags, boxes, or other insecure packages. The cars are of the outside steel frame or Canadian Pacific type construction, of 80,000-lb. capacity, and have the following general dimensions:

Inside length	40 ft.
Length between end sills	40 ft. 11 in.
Length over running boards	42 ft. 1 in.
Length over striking castings	42 ft. ¾ in.
Center to center of bolsters	31 ft.
Width inside	8 ft. 6 in.
Width over steel side sills	8 ft. 8¼ in.
Height from top of floor to under side of carline	8 ft.
Height from rail to top of floor	4 ft. 1 in.
Height from rail to eaves	12 ft. 5⅝ in.
Width of side door opening in clear	6 ft.
Height of side door opening in clear	7 ft. 7⅛ in.
Truck wheel base	5 ft. 6 in.

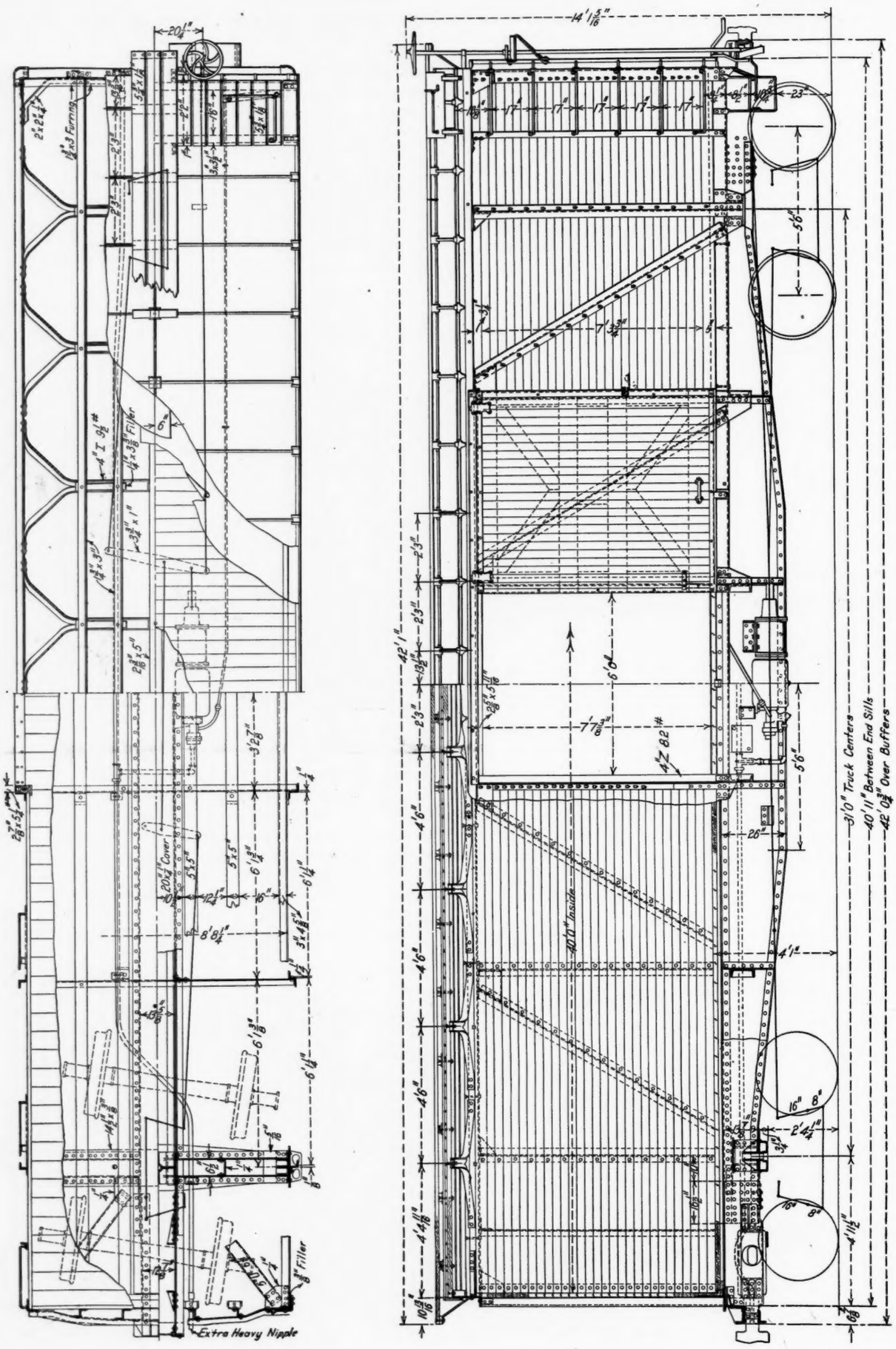


Steel Frame for St. Louis & San Francisco 40-Ton Box Cars.

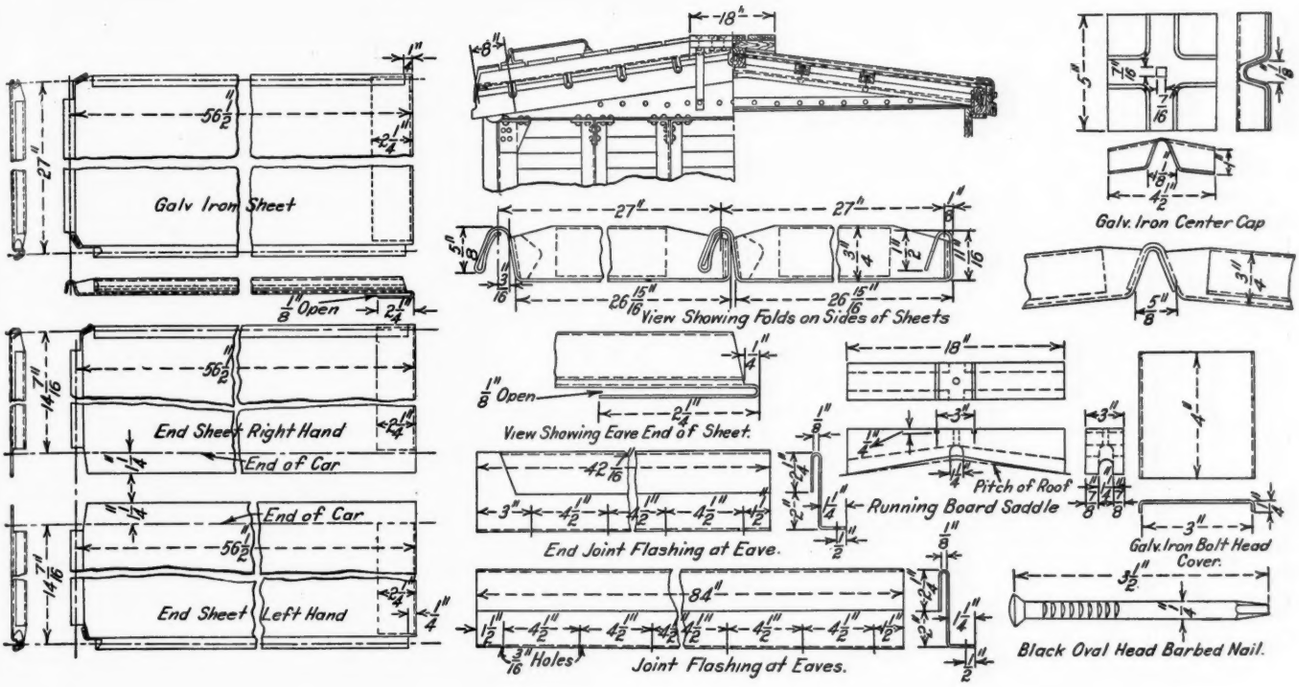
The steel underframe, together with the steel framing for the superstructure, including the eight Posson I-beam carlines, furnished by the Camel Company, provides a comparatively rigid structure and furnish a very substantial support for the roof.

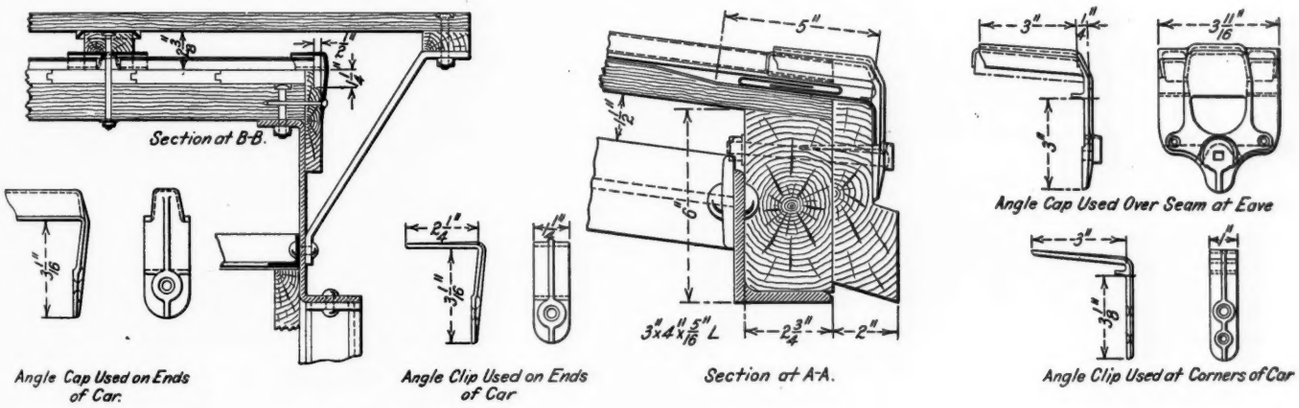


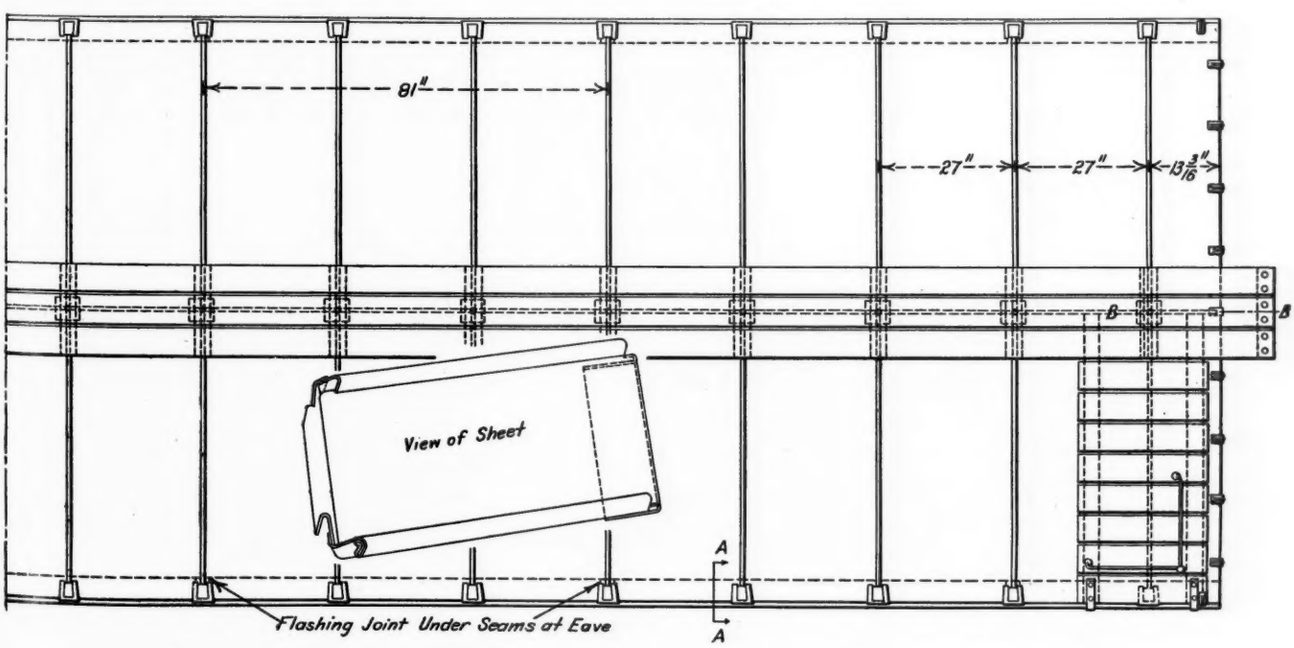
Forty-Ton Outside Steel Frame Box Cars; St. Louis & San Francisco.



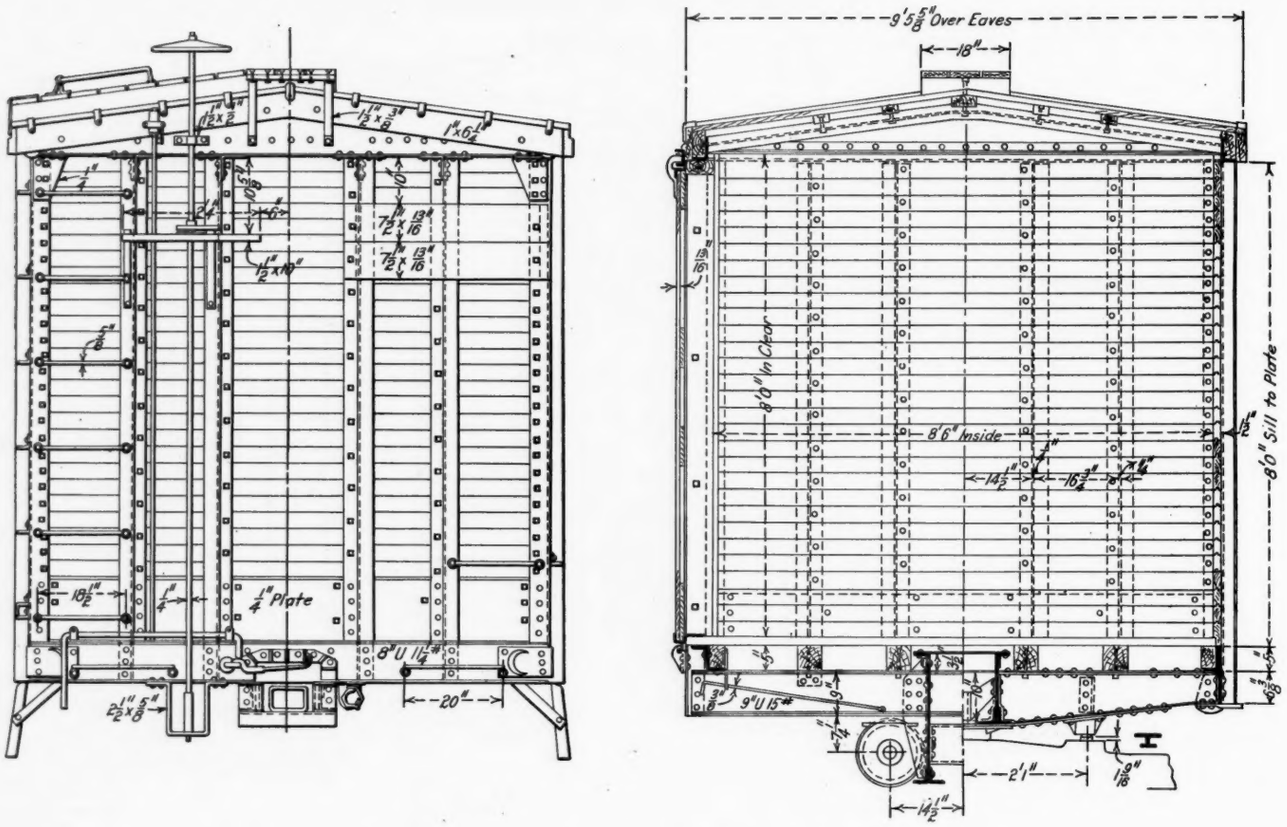
General Arrangement of Outside Steel Frame 40-Ton Frisco Box Car.


Galv Iron Sheet
End Sheet Right Hand
End of Car
End of Car
End Sheet Left Hand
View Showing Folds on Sides of Sheets
View Showing Eave End of Sheet.
End Joint Flashing at Eave.
Joint Flashing at Eaves.
Holes
Galv. Iron Center Cap
Pitch of Roof
Running Board Saddle
Galv. Iron Bolt Head Cover.
Black Oval Head Barbed Nail.

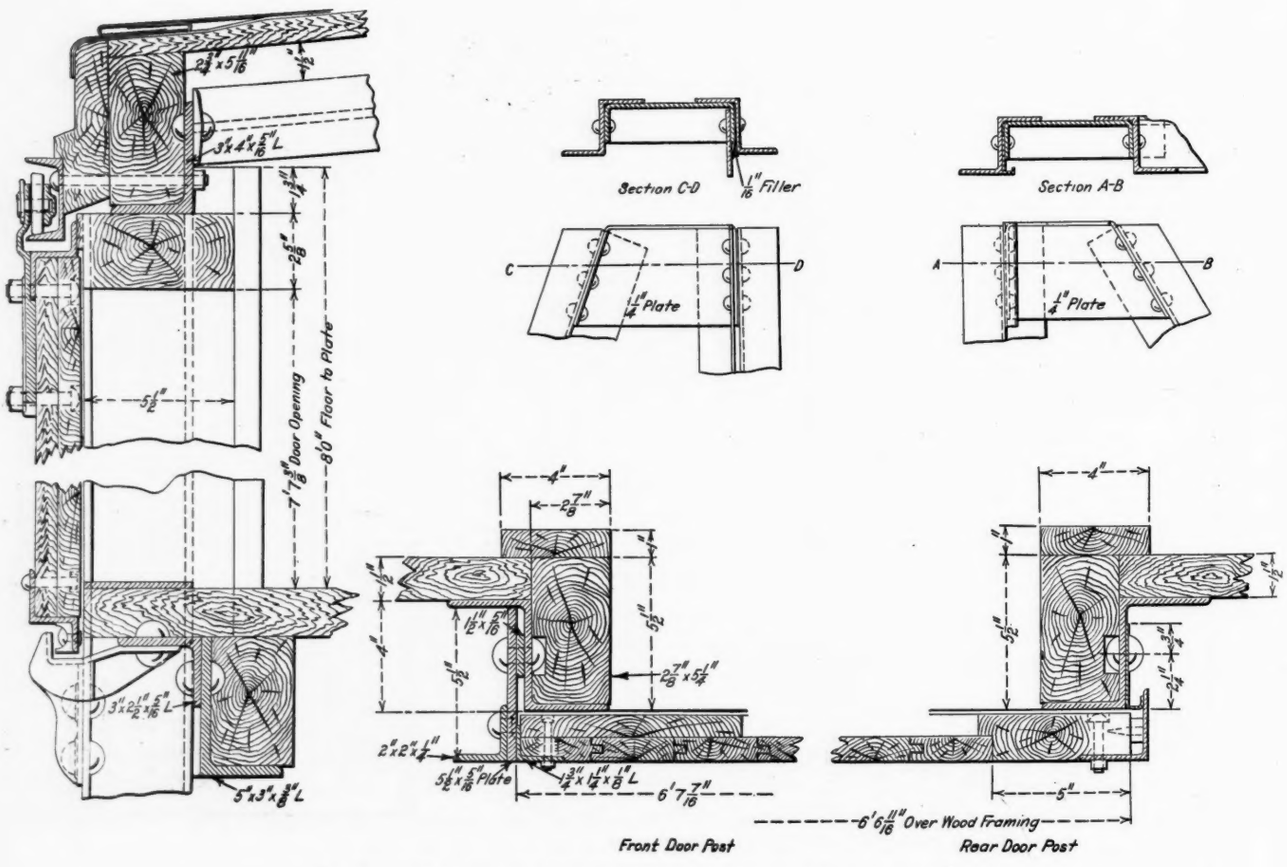

Section at B-B.
Angle Cap Used on Ends of Car.
Angle Clip Used on Ends of Car
Section at A-A.
Angle Cap Used Over Seam at Eave
Angle Clip Used at Corners of Car



General Arrangement and Details of Murphy X L A Roof as Used on the Frisco Box Cars.



End and Sectional Views of 40-Ton Frisco Box Cars.



Details of Side Door Application as Used on Frisco Box Car.

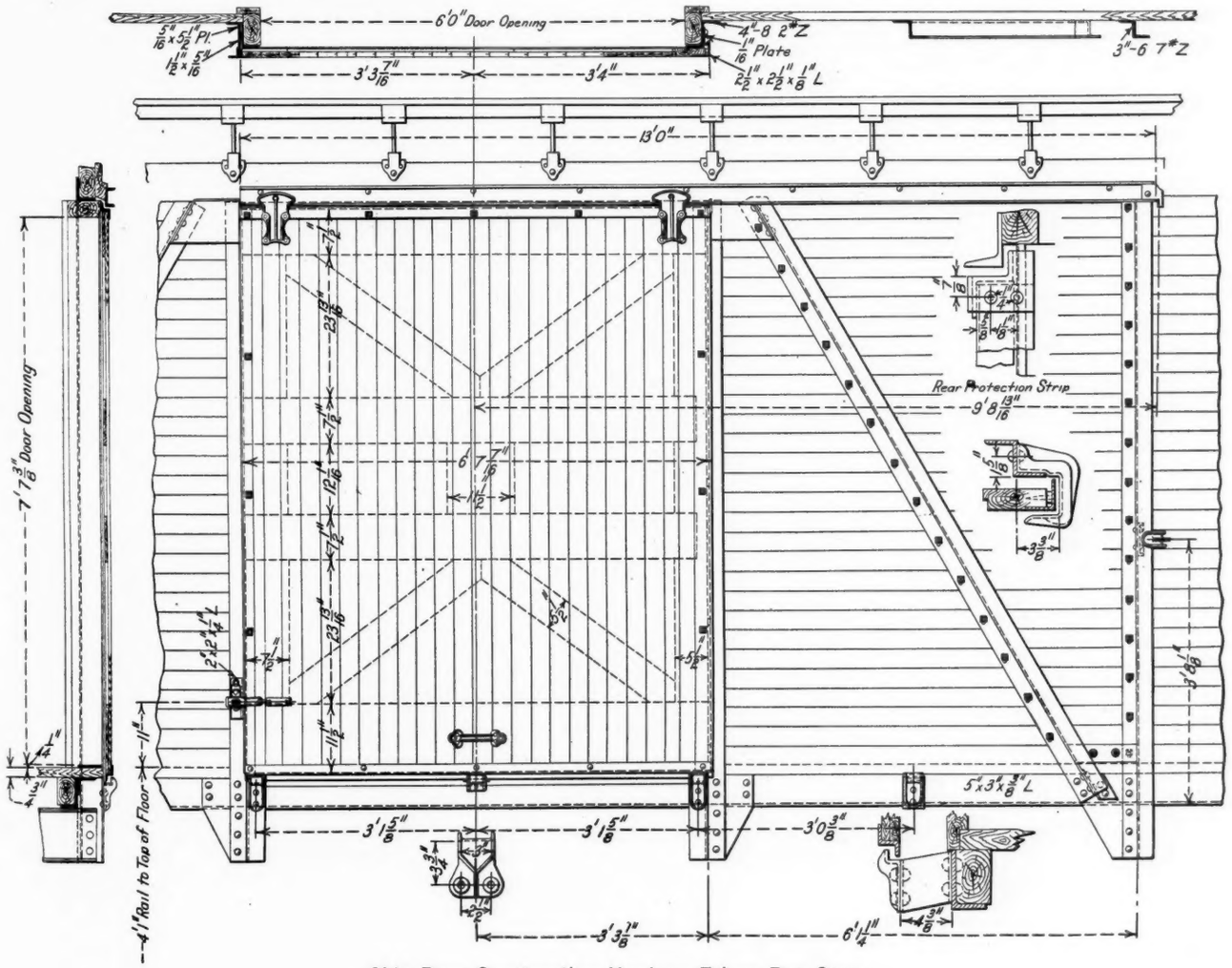
A Murphy outside metal roof, type X L A, is used and as an additional safeguard against leakage, the railroad specified that this was to be placed over a layer of asphaltum coated burlap, which was laid flat on the single course of 13/16 in. yellow pine roofing boards.

The center sills consist of ¼ in. web plates with 3 in. x 3 in. x ¼ in. top angles and 3 in. x 3 in. x ⅜ in. angles on the outside at the bottom and 3 in. x 3 in. x 5/16 in. angles on the inside. The web plates are continuous between the bolsters and extend 2 ft. 2½ in. beyond them in order to provide for the splicing of the draft sills. The center sills are 26 in. deep at the center for a distance of 11 ft. and taper to 13⅞ in. in depth, 10 in. back of the center line of the bolster. A 20 in. x ¼ in. center sill cover plate extends for the full length of the car. The draft sills are of ⅜ in. pressed steel plates flanged to Z shape, and are connected to the striking castings at the front by 3 in. x 3 in. x 5/16 in. angles. Cardwell type G-11 draft gear is used with Latrobe 5 in. x 7 in. shank steel couplers. The couplers are controlled by the Imperial Appliance Company's uncoupling device.

The side sills are 5 in. x 3 in. x ⅜ in. angles extending the full length of the car and are secured to the end sills by ¼ in. pressed steel combined corner bands and push pole pockets. These sills rest directly on top of the bolsters and crossbearers with the 5 in. leg vertical. The end sills are 8 in. channels weighing 11.25 lbs. per ft. The end sill top cover plate is 12 in. x ¼ in., shaped to conform to the contour of the end sills.

The body bolsters consist of 5/16 in. pressed steel channel plates placed 6½ in. apart back to back. The top cover plate is 14½ in. x ⅜ in. and passes through slots cut in the center sill webs. The bottom cover plate is 18 in. x ⅜ in. The center filler is of malleable iron; a steel casting forming a combined roping and jacking casting is applied at the ends of the bolster. The diagonal braces in the underframe extend from the juncture of the side and end sills to the juncture of bolster and draft sill and consist of 5 in., 6.5 lb. channels placed with the flanges down. There are four 9 in. channel floor beams, weighing 15 lbs. per foot, which extend the full width of the car and pass through slots which are cut in the center sill web. They pass under the side sill and form a direct connection with the Z-bar side posts.

The side plates consist of 4 in. x 3 in. x 5/16 in. angles, extending the full length of the car, and with the 4 in. flanges vertical. The side posts are 3 in., 6.7 lb. steel Z-bars, which



Side Door Construction Used on Frisco Box Cars.

extend from the underside of the side plate angle to the bottom of the bolsters and cross-bearers, to which they are riveted. The center side braces are also 3 in., 6.7 lb. Z-bars, while the intermediate side braces are 3 1/16 in., 8.4 lb. Z-bars. The door posts are 4 in., 8.2 lb. Z-bars, as are also the end posts at the center. The intermediate end posts are 3 in., 6.7 lb. Z-bars. The corner posts are 5 in. x 4 in. x ⅜ in. angles, which extend from the underside of the side and end plates to the underside of the end and side sills. Angles of ⅛ in. pressed steel at each corner of the car perform the function of rain caps, closing the joint between the side and end plates and protecting the top of the corner posts.

The end plates are 3/16 in. material flanged to a Z shape 10 15/16 in. deep at the center and tapering to the side plates

with the ends flanged around and riveted to the side plates. The end plate has a 3⅛ in. flange at the top, which turns in and provides a bearing for the ridge pole and purlines. At the bottom it has a 4 in. flange turned outwardly to form a bearing for the end and corner posts. The ridge pole is of yellow pine, 2 3/16 in. x 5 in., and the purlines are 1¾ in. x 3 in. The side fascia is of yellow pine, 2 in. x 6¼ in., and the end fascias are 1 in. x 6¼ in.

The frame work, being on the outside, makes it necessary to provide an inside lining only, as shown on the drawing, and the sheathing is in narrower widths than usual with a view to reducing the shrinkage of the side planks. Ordinarily in this type of car the material is used in 5¼ in. widths, while on the Frisco cars it is only 3¼ in. wide. The lining, which is 1½ in. thick, is connected to the members of the metal frame work by ⅜ in. carriage bolts. The lower side board is cut in ½ in. at the floor level to allow the floor planks to pass under the edge. At the ends of the car the floor board is gained ½ in. to allow the lower end lining board to fit below the floor level, thus insuring a tight fit. The end is also reinforced at the bottom of the lining for the full width of the car by placing a ¼ in. steel plate on the outside of the lining extending about 9 in. above the floor and riveted to the end and corner posts. The lower edge of this plate is flanged at the bottom and is riveted to the end sill cover plate. This not only stiffens the ends but is an additional precaution against the leakage of grain at that point. The flooring is of yellow pine, 1¾ in. in thickness, and is nailed to side nailing stringers of yellow pine, 3 in. x 4⅝ in., and two center and two intermediate stringers, 5 in. x 5 in. The flooring at the door openings is supported by 3 in. x 2½ in. x 5/16 in. angles, riveted to the side sill angle.

Wooden ends were used on 973 of the cars and corrugated metal ends furnished by the Standard Railway Equipment Company were placed on 27 of the cars for test purposes.

The side doors are equipped with Jones Peerless fixtures and Positive malleable iron door fastenings. The bottom guides are riveted to the door post, floor support angle and the ¼ in. bracket. The door is stiffened horizontally at the top and the bottom by 1¾ in. x 1¾ in. x 1¼ in. x 3/16 in. Z-bars; it is stiffened vertically at the front edge by a 1¾ in. x 1¼ in. x ⅛ in. angle, and at the rear edge by a 2½ in. x 2½ in. x ⅛ in. angle. The front edge of the door is protected against weather, cinders, etc., by a 5/16 in. vertical bar which is riveted to the door post and spaced 5/16 in. from it by a filler, the bar abutting the front edge of the door when the door is in a closed position. The rear edge of the door is protected by a 1/16 in. steel bar which is riveted to the door post and is bent in a U shape to form a contact with the vertical rear door edge stiffener angle.

The trucks have cast steel frames furnished by Scullin-Gallagher Iron & Steel Company, and the cast steel truck bolsters were made by the same company. These cars were built by the American Car & Foundry Company.

Kwangtung Yueh Han Railway.—The Canton-Hankow Railway, begun by the American China Development Company, and since 1905 under construction by a Chinese company, has been pushed forward rapidly this summer. On May 25 the important station Ying Tak was formally opened to traffic. On June 1 the road was declared open to the next station, Ho Tou, nearly 96 miles from Canton, and to Sha Ho, at mile 109 early in August. Beyond this point to Shin Kwan the roadbed has been nearly completed and is about ready in all parts for laying the rails. If advanced at the same rate during the fall and winter it is expected that the line will be open to Shin Kwan, 139 miles from Canton, by the end of 1913 or shortly thereafter. North of Shin Kwan nothing has been done beyond the preliminary survey. From here on to the end of the province will be far the most difficult part of the road to construct In the North River Valley there will be a number of fills, cuts, bridges and culverts, and tunnels.

SAFETY FIRST EXHIBITION OF THE PENNSYLVANIA RAILROAD.

A comprehensive exhibition of safety-first devices was opened in the Y. M. C. A. quarters in the Pennsylvania Station, New York, on September 26. The exhibition occupied three rooms, and was held under the auspices of the safety committee of the Manhattan division of the Pennsylvania Railroad. It was held primarily for the purpose of educating the employees of that division and, in order that both day and night workers might attend, the doors were opened early in the afternoon and were not closed until half-past ten at night. The exhibition closed on September 30.

Among the exhibits were the following: Section of track; miniature telegraph line; emery wheels, guarded and unguarded; insulated or protected track tools; a lathe showing gear guard; chip guard; drill press with guard; saw guard; shaper guard; fire extinguishers; old style set screw and hollow set screw which has taken its place; boards showing protruding nails; defective jumpers and good jumpers; unprotected and protected station platforms; ropes and chains, perfect and defective; marker lamps in good and bad condition; barrels and boxes of freight properly and improperly piled on floor and on hand trucks; fire alarm apparatus for station and tunnels; safe and unsafe heavy lamp shade supports; switch and rheostat with live parts protected; safe and unsafe devices for operating baggage elevators; brake hose, perfect and imperfect; hundreds of photographs illustrating safe and unsafe methods of working on cars, tracks, etc.

The various safety appliances attached to the different kinds of equipment exhibited, were not only thoroughly inspected by those who attended, but there were demonstrators present to show and to explain the right and wrong methods of handling machinery, tools, etc.

Practical demonstrations by employees of first aid to the injured were features at the evening sessions. For example there was an exhibition in resuscitation from electric shock. The increasing use of electricity about the shops, stations and all other property of the Pennsylvania Railroad, makes it necessary that employees be qualified to render intelligent assistance in case of electrical accident. To this end employees are instructed first, in the safe removal of the victim from contact with live wires and third rails; second, in the approved method of resuscitating persons apparently dead from electric shock, and third, in the care of the victim when natural respiration has been restored.

Employees also illustrated the treatment for hemorrhage, fracture, burns, unconsciousness, fits, heat exhaustion and sunstroke. The Pennsylvania standard "first aid packet," which may be found at stations, telegraph towers, in yard buildings, tool houses and on trains, played an important part in these demonstrations. The "first aid packet" is a sanitary tin box containing two asceptic compresses wrapped in oil paper, one cambric bandage, one triangular bandage and two safety pins.

Several booklets issued by the Pennsylvania Railroad for the benefit of the employees were distributed. Some of them were: Safety Hints and Suggestions for the Prevention of Personal Injury Accidents; Precautionary Measures for the Prevention of Accidents at Freight Stations; Instructions for the Guidance and Protection of Employees (in English, Italian and Polish); Hints on First Aid to the Injured, and Courtesy.

Light Railways in India.—The Bombay government, in the course of a review of the Land Revenue Administration, states that one of the two most important events of the year was the steady progress made in the extension of feeder railways, and that the network of light railways which are under construction in Gujarat will have far-reaching results in promoting the welfare of the districts through which they pass.

HOWARD ELLIOTT AND NEW ENGLAND.*

When I decided to come back to my old home in New England some of my friends said, Why leave this great and growing West for a country that is developed and finished? I told them that in my judgment there was going to be just as much growth and development in New England in the next twenty-five years as anywhere else, and there will be if the intellectual and financial ability of the men in New England can co-operate unselfishly with that end in view. I told them that I had a great love for New England, and that, strong as was my feeling for the West, the idea of spending the last years of my life here, where my relatives and lifelong friends are, and where my children are going to school and college, appealed very strongly to me.

There is an old saying that reads: *"Man's work lasts till set of sun; woman's work is never done."* This is true about the railroad. Its work is never done. Men may think they have provided sufficient transportation facilities for years to come, but the growth of the country is so great that things that looked far too big a few years ago are far too small now. For every dollar of gross earnings produced by the railroad there is a value in the plant used of nearly $6 upon which owners are entitled to a fair return. For every increase of $1 in gross earnings which reflects the increase in general business in the country there must be provided by someone more than $6 of new capital for increased and improved facilities.

For New England to grow as she will in common with the rest of the country she must have a comprehensive, adequate and safe system of transportation. The new capital needed in this section for each increase of $1 of gross earnings will be greater than the average in the United States because of more perfect and luxurious service demanded.

Each year the New England lines and associated properties, including the steamboats and electric lines, carry 252,000,000 passengers, a number which is more than double the entire population of North American. Expressed in other terms, the New England lines hourly transport 30,000 people.

The figures for the volume of freight business indicate an immensity of transactions which few appreciate. Every year 78,000,000 tons of freight are carried—9,000 tons every hour. The complexity of the problem, however, is not indicated by the tonnage alone. In connection with its movement 13,600,000 way-bills are issued. Each way-bill, however, usually covers several items, and it is estimated that the number of freight transactions in a year is 44,000,000, 141,000 for each working day, or nearly 5,875 for every hour of the day. Is it to be wondered at that some shipments go astray or that some freight is damaged?

The unusual character of the railroad business of New England is apparent when the returns for the New Haven road are compared with those for the entire United States. Considering all the railroads of the country as one system, two tons of freight are transported to every passenger. On the New Haven road alone, the ratio of freight to passenger business is reversed. That road transports only one-third of a ton to one passenger. The passenger density of the New Haven road is more than six times as great as that on all the railroads of the country considered as a system. These figures show the marked preponderance of passenger business in New England. Through the Boston South Station alone 105,000 people pass daily. The passengers passing through that one station each week equal the total population of Boston.

To have this great transportation machine work smoothly with the fewest points of obstruction and interruption—the least amount of friction, and with the greatest harmony among all its constituent parts, means, in the long run, the furnishing of the best transportation service to the people of New England.

The total taxes paid by these properties was $7,640,000, a substantial contribution to the funds for carrying on the government.

*Abstract of address before the Boston Chamber of Commerce.

But the people of New England have other interests in their railroads. Not only is the railroad service a vital part of the social organization, but its earning power as well affects a large and widely distributed number of investors. The number of security holders of the New Haven and New England lines and associated properties is estimated at 60,000. The majority of them live in New England.

It is commonly believed that railroad stocks are concentrated in the hands of a few. That this is not true of the New Haven and Boston & Maine will be apparent when it is known that 43 per cent. of the New Haven stockholders own only from one to ten shares each, and 38 per cent. own from 11 to 50 shares each. With Boston & Maine stock the proportion of investors holding a small number of shares is even more striking.

To maintain and operate this great transportation machine requires the services of from 90,000 to 100,000 men (92,792 on last pay-roll). These employees and these investors are drawn from all walks of life. They are human beings with hopes and aspirations and joys and sorrows. The livelihood of employees necessarily depends upon the return from their labor and this in turn depends upon the prosperity of New England and the railroads of New England. In a smaller degree the comfort and well being of many investors depend upon the return from their investment, and this also depends upon the prosperity of New England and of her railroads. These investors and these employees, with their families, on the basis of four to one, make 640,000 people, or nearly one-tenth of the population of New England. Should not their rights, comforts and feelings be considered carefully in the current tempestuous discussion in regard to the New England railroads?

The stockholders of the three important New England railroads—the New Haven, the Boston & Maine and the Maine Central, have selected forty-eight men to act as their directors. Of these, three sit on all three boards and eight sit on two boards. Of the forty-eight directors, forty-two live in New England, four in New York and two in Philadelphia. Those who are also directors of the so-called Trunk lines outside of New England are five in number.

These directors are interested in the welfare of the roads they represent, and of the country that those roads are trying to serve. They exercise the final powers of management, and can approve or disapprove the action of the officers, and can direct them. They cannot know all details and they must rely largely on the reports and recommendations of the officers on whom rests the first responsibility of careful investigation of the problems of management. They demand that the officers give their undivided time and attention to the railroad business, and to working harmoniously with the patrons of the roads, the employees and the public authorities.

The report of the Interstate Commerce Commission about the New England railroad situation was submitted by Mr. Prouty on June 20, 1913. Since then the directors have been engaged very busily in discussing the large question of a new management and of some financing that is imperative. The important suggestions in that report will be taken up and considered very carefully and some conclusion reached as rapidly as practicable. The very grave importance of the suggestions and recommendations and the source from which they come mean that they cannot be decided hurriedly and without very thorough study. Already some steps have been taken so as to have closer supervision of the details of the operations of the properties. Three men have been selected to fill the important position of president on the Boston & Maine and Maine Central, on the New Haven, and on the New York, Ontario & Western. One large operating division on the New Haven road, formerly under one superintendent, now has a general superintendent and two division superintendents. Other steps of this character will be taken if careful study of the situation shows that they are necessary for efficiency and safety.

It is difficult to obtain the material things needed for the upbuilding of a railroad, but it is even more difficult to get men.

No more important work faces the management than to create a staff of officers that can carry on this great work and have it so organized that when for any reason one man retires there is another to take his place. Equally important is the work of encouraging the great army of employees and of inspiring them with a feeling of loyalty to New England and to the railroad, and of making safe the conditions under which they work. Every effort will be made to build up a complete staff of officers and men from those now in the service and in New England, men who know the local conditions, and who will respond loyally to suggestions for the closest, most efficient and economical operation. These two pieces of work are even more important to the travelling and shipping public than to the owners, because the daily work of the railroad must be done, or people will starve, or freeze, and business stop. This daily work cannot be done right if officers and men are harassed and worried.

Let me ask you in all seriousness, if service with the New England railroads has been attractive enough in the last few years to draw into it men who have any choice in selecting their life work. Will not better results be obtained if more consideration is given to officers and men in the service—men who are as good as those in other walks of life, and the large majority of whom are most anxious to do their duty? Is it not in the interest of New England to treat her servants in the railroad service so that the best talent in the country will want to serve? Mr. McDonald, his staff and employees are trying to accomplish results on the Boston & Maine and Maine Central; Mr. Hustis, his staff and employees will try to do the same on the New Haven road; Mr. Campbell is helping both in trying to adjust a complicated rate or price list so as to earn enough to give the prompt and regular service that all want. Mr. Kerr and his men are doing the same for the Ontario & Western. Other officers and men are doing their best with other properties. I shall work with and through these men and try to have their knowledge and experience, as well as my own, used to the very best advantage for honest, economical management, and for efficient and safe operation.

All of us are animated with a high purpose to do our full duty, and we have no desire for self aggrandizement and self glorification. Our reward will come, if, in time, this complicated machine can be adjusted so that it will run smoothly, without friction, pay a fair return to the owners and become so much a part of the daily life of the public that no more attention is paid to it than is paid now to drawing water from a faucet or turning on an electric light.

Will we not advance the interests of New England, and the peace, prosperity and contentment of her people if we are careful to be temperate and accurate in our statements and criticisms of others?

Man-fashion, we must take the situation as it is and carry the burden as well as we can. We must be thankful for the good things of the past, and try so to improve the situation that those who come after us will be thankful for some good work and not too uncharitable about the mistakes that will undoubtedly be made. We will try, however, not to make the same mistakes twice. It does not seem as if any positive beneficial results can be obtained by a lack of confidence and by continuous wrangling. If the people of New England cannot trust their railroad management, and if the railroad management cannot trust the people of New England, a situation is created that is unfortunate now and more unfortunate for the future and for our children and grandchildren, because so much needs to be done in the developing and upbuilding of the New England states. I believe we can all trust one another, and I, for my part, will do all that I can, and see that the officers and employees of the various railroads do all they can to bring about that condition. Intelligent and wholesome criticism is asked for and expected, and such criticism is a spur to the management to be faithful to their trust and careful in their work.

There will always be differences of opinion between those that you represent, buyers and users of transportation, and those that I represent, manufacturers and sellers of transportation, because buyers and sellers in the nature of things will not always agree about the price and the quality of the article or service furnished. In such cases I hope we can discuss the differences calmly, without prejudice, and without any disturbance to the transportation machine which is so delicately adjusted, and without any demoralization among officers and employees, because any disturbance of this transportation machine reacts in many directions. I hope that if we should be unable to agree among ourselves, we can arbitrate the matter in an orderly way before those tribunals and courts which have been created for such purposes.

In managing a railroad, just as in any other business, different kinds of talent and ability must be employed to safeguard the business—engineering talent, operating talent, commercial talent, and financial talent. In a very large business the best talent should be employed and the going prices for such talent must be paid. The management of the New England lines wants to use the best financial talent it can find to help it in raising the money needed. It wishes to employ those bankers, no matter where they live, who can do the work. It would prefer to employ bankers in New York and Boston who naturally want to help the development of the country and of the roads. The management of the properties will be more than pleased if New England bankers, banks and investors will furnish their full share of the money needed now and in the future, and will assist in obtaining that money in the markets of the world.

If a business is stagnant and dying of dry rot no new money will be needed and there will be no need of the help of the experienced banker or financial agent; but if the business is to grow, especially if it is a public service business, which must respond to the demands of the public for good service, new money over and above what can be obtained from earnings is needed at frequent intervals and in very large amounts.

The greater the amounts needed the greater the need of expert advice and financial aid of the very best quality, because by training and experience bankers know where and how money can be obtained. With proper aid from bankers the officers of the company will not have their attention too much diverted from the work of careful management, safe and efficient operation, and good service to the public.

The United States government, state governments and municipalities all turn at times to the banker for his aid in placing their securities in the hands of small investors all over the country.

New England can and will have the kind of railroad management and service to which she is entitled. Payment for this can be made in three ways:

(1) By some increase in rates.

(2) By the stockholders, who live in the country to be served, advancing the money.

(3) By borrowing the money needed, wherever it can be obtained. Probably a combination of all three plans is necessary at this time of crisis in the New England railroad situation. All are interested in helping to uphold the credit of New England roads so that money can always be obtained on the best terms.

If and when the money needed is furnished the management proposes to spend it prudently in improving and perfecting properties now owned. The management proposes to confine its activities to the transportation business.

PARAGUAY CENTRAL RAILWAY.—The Paraguay Central Railway Company has received the following cablegram from its general manager at Asuncion with reference to the train opening for business of the ferry between Paraguay and the Argentine: "Expect to open freight traffic to Buenos Aires in a few days. First passenger train leaves Buenos Aires for here on October 12."

CONSTRUCTION OF THE BUCKHANNON & NORTHERN RAILROAD.

BY R. E. KERR,

Assistant Engineer, Buckhannon & Northern, Morgantown, W. Va.

Of the bituminous coal measures of West Virginia and Pennsylvania, one of the most valuable is that known in northern West Virginia as the Pittsburgh vein, a low sulphur coal which is easily coked. There is at present a vast area of this coal measure which is not accessible to the markets on account of lack of transportation facilities and it was to bring a portion of this coal to market that the Buckhannon & Northern, now nearing completion, is being built.

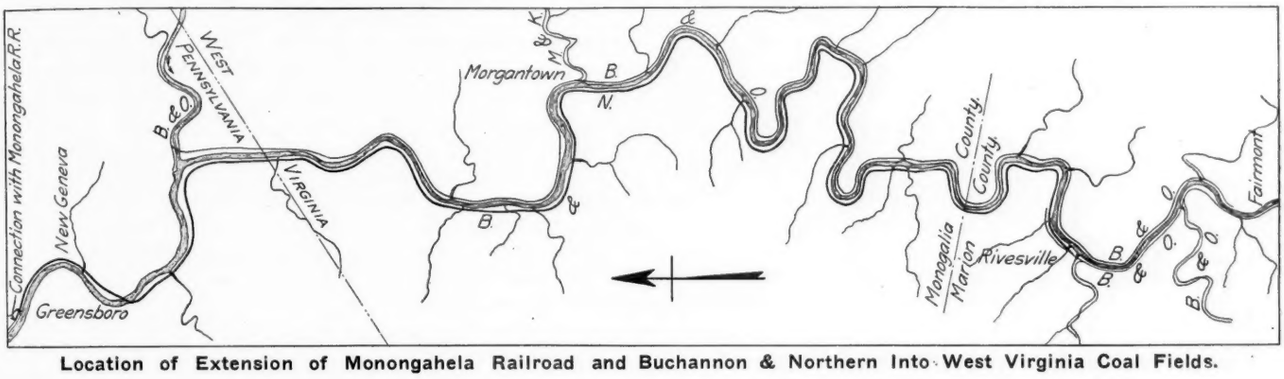
This railroad starts at the West Virginia-Pennsylvania state line, where it connects with an extension of the Monongahela railroad which is also now being constructed, and follows the west bank of the Monongahela river to Rivesville, W. Va., about five miles north of Fairmont where it connects with the Catawba branch of the Paw Paw railroad, a subsidiary of the Baltimore & Ohio. The coal to be developed all lies west of this line and can be conveniently reached by branches built up the tributaries of the Monongahela. There are several workable veins in this territory other than the Pittsburgh, the most important being the measures known locally as the Sewickley and the Freeport.

The stock in the Buckhannon and Northern is owned by the Little Kanawha Syndicate, which owns the charters of a number of roads started in West Virginia, Ohio and Pennsylvania, in 1902 and 1903. The stock in this syndicate is now held jointly by the Pittsburgh & Lake Erie, the Pennsylvania and the Baltimore & Ohio. It will have connection with Pittsburgh by way of the Monongahela railroad to Brownsville, Pa., and from there by branches of both the Pittsburgh and Lake Erie and the Pennsylvania, and it will reach the eastern markets by way of the Baltimore & Ohio.

The route to Pittsburgh follows the Monongahela river the entire distance, and as the fall of the river is very slight, the grades are very light, the maximum on the Buckhannon & Northern being 0.15 per cent. There are extensive fields of coking coal throughout the entire distance and as these roads were all built primarily as coal and coke carrying roads the grades were kept as light as possible.

The original survey for the Buckhannon & Northern was made in 1902 as a branch of the line then being constructed. In the fall of 1903, construction was stopped on the main line and nothing further has been done on it since that time. A new survey of the branch was made in the early part of 1910, and the company immediately started to procure right of way which was all acquired before construction was commenced.

Plans were made for a first class line as far as physical conditions are concerned. As before mentioned, the maximum grade is 0.15 per cent., and there are several miles of level grade. The maximum curvature is 8 deg., and there are only two curves this heavy, both of which may be later taken out and replaced with 6 deg. curves, making that the maximum. The structures

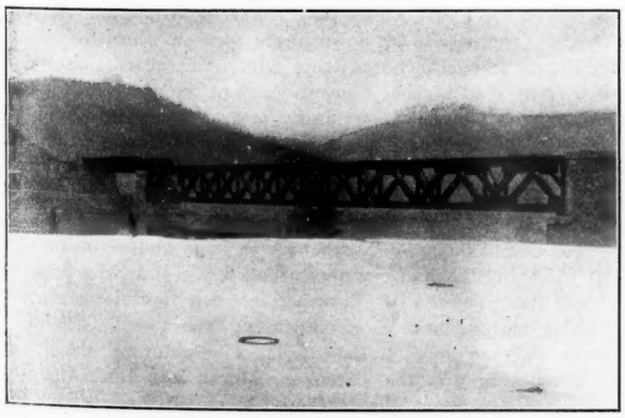


Location of Extension of Monongahela Railroad and Buchannon & Northern Into West Virginia Coal Fields.

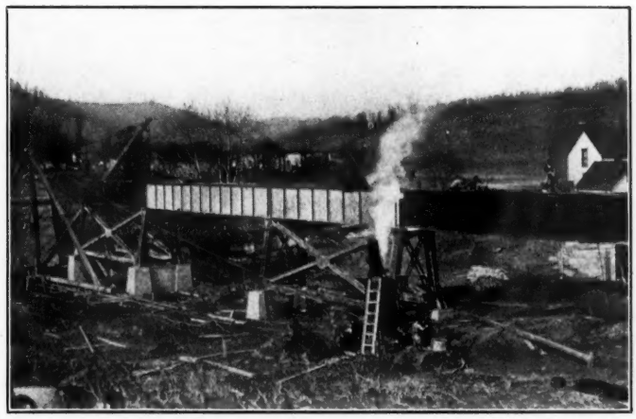
are all designed for the heaviest class of traffic and great care was used to obtain good drainage. The bridges are built on the specifications of the Pennsylvania Lines West. The track is laid on 85-lb. rail with ties spaced 22 in. between centers. Granulated slag ballast was used to put the road in condition for operation, though it is intended to eventually cover this with broken stone.

Construction was started on the Buckhannon & Northern in the early part of 1911 and was pushed as rapidly as conditions permitted. While the grading was not particularly heavy, averaging about 45,000 cu. yds. per mile, it was made difficult by the great number of slides, especially those under embankments, necessitating several changes of alinement after the grading on the original location was practically completed. Most of the excavation was done by steam shovels, but the lighter sections were generally graded with small dump cars filled by hand.

There are five steel bridges on the line, the two largest being Dent's Run bridge, a viaduct 274 ft. long, and the Indian Creek



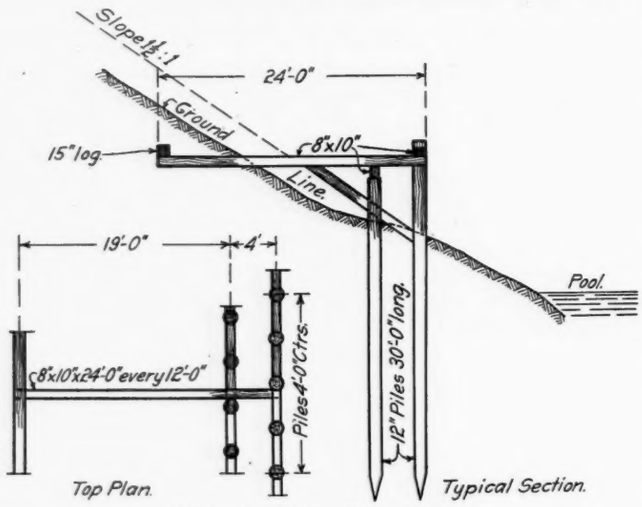
Indian Creek Bridge.



Dent's Run Bridge.

bridge, which consists of one through girder and two deck trusses 290 ft. 2 in. over all. The latter, which is shown in one of the accompanying photographs, is a good example of the general design used on all the bridges, as practically the same conditions obtain all along the line. On account of the river being slacked by dams in the main stream, the mouths of the tributaries present the appearance of small bays into which the stream empties some distance from the river. For this reason there is very little washing around the ends of the bridges to guard against, and in most cases it was feasible to use the same type of abutments as those at Indian Creek bridge. So far these abutments have stood up perfectly and have shown no signs of cracking.

Four of the five bridges are extended to serve as crossings over public roads while the principal thoroughfare from the west side of the river into Morgantown crosses overhead. The remainder of the highway crossings, 15 in number, are at grade but none of them are important roads. The two crossings of the Morgan-



Method of Stopping a Slide.

town and Dunkard Valley railroad, an electric line, are undergrade, this line being so located that it was possible to take it under two of the bridges before mentioned.

The culverts of 35 sq. ft. opening and up are plain concrete, semi-circular arches, the largest being one of 24 ft. span, over Crooked Run near the northern terminus of the line. The next smaller size were generally built of coursed rubble cemented and were of the flat top type. For places where 10 sq. ft. of opening or less is required, reinforced concrete pipe with rubble or concrete headwalls was used. Building stone suitable for these structures is everywhere abundant within a short distance of the line. The concrete pipe was made by the Reinforced Concrete Pipe Company of Jackson, Mich., and was all built at one point on the line and was delivered by steamboat at the different locations where it was to be used.

Several retaining walls were required, two being built of reinforced concrete, two of plain concrete and the remainder of rubble masonry. One of the rubble walls failed and was rebuilt to heavier section and on a firmer foundation.

The Monongahela river was of great convenience to the contractors in getting their masonry material to the sites of the structures as it is nowhere over 500 or 600 ft. away from the line and is navigable at all seasons. Allegheny river gravel was used in all the concrete and was brought direct from the dredges to the work in barges. Sand was obtained from Cheat river, a tributary of the Monongahela river, about two miles north of the Pennsylvania-West Virginia state line.

The construction was unusual with regard to the great number and size of the slides encountered. Those coming in from above grade in cuts were excavated except in two cases, where it was necessary to protect adjoining property and where plain concrete retaining walls were built to hold them. Though these slides were a source of great expense, they did not present the difficulties of treatment that those below grade did. The river at its present level flows through a narrow valley cut in the shales and sandstones of the coal measures. The narrow bottom lands along it are composed of silt and the wash from the steep hillsides and lie on a steeply sloping bed of shale. It takes but very little superimposed weight to start these narrow bottoms moving, and once started they will not stop until the new surface is at approximately the same level as the old.

Wherever possible, when the fills on these bottoms started moving toward the river, the alinement was changed so as to place the roadbed in cut and on solid material. In several places, however, where the cost of doing this was prohibitive, or where there were right of way or other interferences, several different expedients were used. When the fill was very shallow and the underlying shale was soft enough, shod piling was driven in two or more rows into the shale to refusal. In most cases where this was resorted to, it held the fill. In two places where the underlying rock was sandstone and very deep, two rows of 6 in. holes, 12 ft. apart, were drilled into it from 6 to 8 ft., and each hole shot with 50 to 75 lbs. of dynamite. In the two cases when this method was used, it entirely stopped the slides but there were very few places where conditions were favorable for its use. In one case where there was no foundation for a wall at a reasonable depth and the underlying rock was too soft to be shot, the slide was stopped by the method shown on the accompanying sketch. The two piles were shod and driven as far as possible into the shale, which in general was about 2 ft. They were then sawed off, the outer row being higher than the inner. An 8 in. x 10 in. stick of timber was then run along and notched into the front row and a cap of the same size drifted on the top of the inner row. Every 12 ft. an 8 in. x 10 in. timber was placed at right angles to the rows of piling, one end of which was fastened under the runner on the outer row and passing over the cap on the inner row and the other end buried in the ground, a section of 15 in. log being placed over the end to increase the bearing area. This proved to be a decidedly cheap and effective mode of stopping slides of this character.

Another slide, resembling the last mentioned, though not nearly so deep, was stopped by driving three rows of piling in a trench excavated 2 ft. below the plane of rupture, then filling the trench 4 ft. with concrete and then refilling to the original surface with earth. While this method was effective, it is very expensive, though it has the advantage of being permanent.

By far the most expensive piece of work erected to control slides was the reinforced concrete retaining wall at the southern terminus of the road. Running north 1,000 ft. from the connection of the B. & N. railroad with the Paw Paw railroad, there was a sinking fill on the latter which required constant work on its part to keep its track passable. As the B. & N. is between the Paw Paw railroad and the river, any fill it might make would be almost impossible to keep up, without something to prevent the ground it was built on slipping into the river. The wall built is 1,000 ft. long and runs from 12 to 26 ft. in height. The base is set down in the rock on which the material is sliding and is anchored there with 1 in. square rods. There is a drain of coke ashes along the back of the wall which is taken through at frequent intervals by means of 6 in. tile and at 8 ft. from the base there is a series of weep holes along the entire length of the wall. After the wall was finished the fill was made above it and no trouble whatever has been experienced since by either railroad.

The Buckhannon & Northern was built under the direction of S. D. Brady, chief engineer of the Little Kanawha Syndicate Lines, and Thomas H. Johnson, formerly consulting engineer, Pennsylvania Lines West, consulting engineer. The bridges were designed by C. I. Lantz. The contractor for the grading and masonry was the Patterson, Moran and Luck Company, and for the bridges, the McClintic-Marshall Construction Company. The track was laid with a Hurley track laying machine, operated by company forces.

REPORT ON NORTH HAVEN COLLISION.

Directors, Called "Magicians in the Art of Finance," Blamed for Not Having Discovered Defects in Operating Conditions.

The Interstate Commerce Commission has issued its report on the rear collision of passenger trains on the New York, New Haven & Hartford at North Haven, Conn., September 2, when 21 passengers were killed and 33 passengers and 2 employees were injured. It is by Commissioner McChord.

From the statement of facts we take certain details which were not given in the report printed in the *Railway Age Gazette* September 12.

The three sleeping cars which were wrecked weighed 66, 56, and 63 tons, respectively. The rear car was built in 1908, the next one in 1893, and the third, which was less seriously wrecked, in 1906. The flagging rule of the New Haven, in addition to the brief paragraph in the standard code, has additional paragraphs prescribing distances which the flagman must go back. Conductor Adams, of the leading train, was making his first trip between Springfield and New Haven as a passenger conductor; but he was well acquainted with the road. In the past 10 years Conductor Adams had received a number of demerits, on one occasion for drinking while on duty, and he had been reprimanded for failing properly to protect his train.

The report makes no comment on the conflict of testimony as to flagging when Adams' train was stopped at signal 83, north of Hartford. Neither do we find any reference to the testimony of a passenger, Mr. Zollinger, to the effect that the fog was not so dense as appeared from the testimony of the trainmen.

In the four years, 1906-1909, Engineman Miller had been charged with demerits eight times, and was cautioned once, reprimanded twice and suspended once. The statements at the trial to the effect that he had never been disciplined more than once or twice apparently referred only to cases of running past stop signals.

C. H. Morrison, signal engineer, said that 25 of the 154 automatic signals between Springfield and New Haven, had distant signals. He had no record of the exact date when the signals were installed.

The report gives in detail the statements presented by General Manager Bardo and Mechanical Superintendent Wildin, concerning expenditures which had been made or ordered for steel cars and other improvements.

The record of discipline since January 1, 1911, for overrunning signals and for inefficient flagging, which was presented by Mr. Bardo, is given in the report at some length.

General Manager Dean, of the Pullman Company, testified that the average number of cars operated by that company during the year ending July 31, 1913, was 5,953, of which 1,882 were all steel and 404 had steel underframes. The contract between the Pullman and the New Haven companies went into effect January 1 last, and on the first of September 47 per cent. of the Pullman cars on the New Haven road were of steel or steel underframe. Mr. Dean gave the capacity of the Pullman shops as two Pullman cars and four other cars per day; and of the other plants in the country he estimated the capacity as follows:

American Car & Foundry Co.:		
Jefferson plant	300	
St. Charles	480	
Berwick	600	
Wilmington	300	
		1,680
Standard Steel Car Co., all plants		420
Pressed Steel Car Co.		360
Barney & Smith		420
Harlan & Hollingsworth Corporation		250
Wason Car Co.		180
Laconia		120
The Pullman Co.:		
Passenger equipment	1,200	
Pullman cars	600	
		1,800
Total		5,230

The report then goes on to give the number of passenger cars in service in the country (as reported in the *Railway Age Gazette* August 15, page 269). Following are the principal paragraphs of that part of the report giving the commission's conclusions:

The automatic signals installed on this line were far from adequate to provide for the safe operation of high-speed trains, especially during foggy or stormy weather, notwithstanding the rule governing their operation. In this district, with but few exceptions, there were no distant signals, and an engineman knew nothing of the condition of the block he was approaching until he saw the signal at the entrance of that block, and even in clear weather trains frequently drifted by, enginemen being unable to see the danger indications in time to stop before passing the signals. If distant signals had been installed . . . the signal system would be much safer.

While the officers did not require enginemen to make schedule time in foggy weather and no action was taken in case an engineman lost time on account of the fog, there was no specific rule requiring reduced speed and no special instructions had been issued to the despatcher or to enginemen regarding the operation of trains during foggy weather. Furthermore, if the records in this case furnish any criterion, it is not unusual to run trains at high speed through fog, and the officers of the road are aware of that fact. While the records show that all five of the express trains lost some time, one of them maintained schedule time from Hartford to Wallingford, a distance of 24 miles.

The despatcher was aware that the weather was foggy; nevertheless, these five passenger trains were permitted to close up within a distance of approximately 10 miles, with only seven signals properly to space them.

In June, 1912, the enginemen had called attention to the inadequate signals in use on various portions of the road, mentioning, among other localities, the line between Springfield and New Haven, stating that it was impossible to comply with the rules and to make the time required of them. A protest was also made against the use of any signals requiring trains to stop without distant signals or caution indications being provided. This communication and protest were given but scant consideration by the officers of the road. The small number of accidents which had occurred was advanced by the general superintendent as adequate justification for no action being taken in the matter. . . . As a result of the action of the Connecticut State Commission, a modern signal system is now being installed between Springfield and New Haven. However, to provide for the safe operation of trains until the new signal system is available, either distant signals should be provided in connection with all the signals now in use, or the signals should be properly overlapped, or block operators should be located at stations along this line and required to space trains a full block apart. Between Springfield and Air Line Junction, a distance of approximately 60 miles, there are 15 stations at which train orders can be received and delivered, an average of 1 station for every 4 miles. In view of this fact, a manual block signal system could readily and quickly be placed in service.

During foggy or stormy weather, when signal indications can be seen but a short distance, positive and definite instructions should be given prohibiting the running of trains at high speed.

In view of the congested passenger-train service and the inadequate signal system on this line, as well as the fact that under the practices followed the danger of rear-end collisions is greater when a flagman is returning to his train, the rules should be changed so as to provide that when a flagman has gone back to protect his train he should not be recalled, but should remain out and be picked up by a following train; and if the number of men now provided is not sufficient properly to protect a train under this method, the number of men assigned to a train crew should be increased.

The position of flagman of a passenger train is one of great importance and grave responsibility. The mere aim to select employees who will make competent flagmen is not sufficient; the responsibility for having in this position at all times a man who is known to be competent and reliable rests with the railroad company, and only those employees who have been thoroughly examined and tested and who have demonstrated their fitness in every respect for performing the duties required of a passenger-train flagman should be selected for this service.

General Manager Bardo submitted a list of enginemen disciplined . . .; the operating officers should have been cognizant of the fact that infractions of this character were occurring with alarming regularity and frequency; and the statements and the records furnished in this case afford conclusive proof that they knew of these dangerous practices. Their responsibility in the matter cannot be evaded.

In the bulletin issued by Mr. Bardo under date of June 1, 1913, the question of the safe operation of trains was discussed and certain rules bearing upon the subject were quoted. But the questions of economy and efficiency were also discussed. . . . The questions of economy, efficiency, and maintaining schedule time were brought out so prominently that it is probable employees might receive the impression from them that the company held these matters to be of equal importance with the question of safety.

It is not sufficient for a railroad company merely to provide signals and rules to govern the operation of trains, to issue bulletins calling attention to the necessity for observing such signals and rules, and to interview and caution employees regarding the observance of signals and rules. But it is the absolute duty of a railroad company to know beyond question whether or not signals are obeyed and rules are rigidly lived up to. Only when this is done can a railroad company provide that measure of protection to which the traveling public is entitled. Mr. Droege's statement that in case employees failed to report instances where enginemen disregarded signals, or flagmen failed to protect their trains properly, there was no method of securing information regarding such occurrences, indicates the entire lack of any adequate system of supervision of employees and of train operation, and the railroad company should without delay reorganize or rearrange its methods of supervision so as to keep in closer touch with its employees and better informed regarding the practices and occurrences on its road.

Mr. Bardo and Mr. Wildin both stated it was their understanding that if the brakes on 85 per cent. of the cars in a train were in working condition the train could be operated without violation of the safety appliance acts. Attention is called to the provision of section 2 of the act of March 2, 1903, requiring that all power-braked cars in a train which are associated together with the prescribed minimum percentage shall have their brakes used and operated. This provision of law clearly prohibits the practice of running a car with its brake cut out in a train otherwise fully equipped with power brakes. To comply with this provision of law railroads almost universally require all the cars in passenger trains to be equipped with brakes in operating condition. It is believed that not only should more complete and thorough inspections and tests be made, but facilities should be provided for making necessary repairs or taking cars with defective brakes out of service in order that all the cars in passenger trains leaving Springfield may be equipped with efficient brakes in operative condition. Under no circumstances should a passenger train be permitted to leave a terminal with less than 100 per cent. of the cars in such train equipped with power brakes in operative condition.

The direct cause of this accident was the failure of Flagman Murray properly to protect his train, the failure of Engineman Miller properly to control the speed of his train in order that he could bring it to a stop before passing automatic signal No. 23, and the failure of Conductor Adams to make certain that his train was properly protected. An additional cause was the failure of Engineman Wands to bring his train to stop, as required by the rules, before passing automatic signal No. 23, which was in the stop position.

While Flagman Murray had had only limited experience as a flagman, he was familiar with the duties required of him. Had he immediately run back as far as possible and lighted a fusee, the accident probably would not have occurred. The rule requires the flagman to ride in the rear car of his train. Flagman Murray was in the second car from the rear, and, as the train was stopped by an emergency application of the brakes, it is obvious that his statement that he left the rear end of the train immediately after it came to a stop, can not be correct. Instead of running back with stop signals to protect his train, he negligently loitered during the six or seven minutes his train must have stood at this place and at no time was he more than 200 or 300 feet from the rear end of the train.

Enginemen Miller and Wands were experienced men and were well acquainted with the rules and requirements for the safe operation of their trains. On account of the dense fog prevailing they should have run their trains at greatly reduced speed. . . . Although the emergency required an engineman to double out of Springfield on this run there was no sufficient reason why one engineman should be required or permitted to continue double duty for a period of one week, as Engineman Miller had done. In each 24-hour period Engineman Miller had had less than six hours of rest in bed at his home. No engineman who takes his rest in such a manner as Engineman Miller did while performing this double duty can be in proper physical or mental condition to perform the exacting service required of an engineman on a high-speed passenger train. Officers directly in charge should have kept sufficiently close watch over an engineman performing such service to know absolutely whether or not he was securing proper rest.

Conductor Adams was a man of long experience. It was his first duty when his train came to a stop to know that it was properly protected. This duty was flagrantly neglected. His evident lack of confidence in Flagman Murray should have prompted him to make certain that Murray was protecting the train. Conductor Adams was well aware that first No. 95 was closely following his train; it was a serious error, amounting to dereliction of duty, for him to stop his train after it had started and to have the flagman recalled.

While this accident was directly due to failure of employees properly to perform their duties, the signal system in use was entirely inadequate . . . and there was a deplorable lack of supervision on the part of operating officers. . . .

The investigation of this accident justifies the following observations and conclusions:

The recurrence of disastrous accidents on this railroad and the large numbers of deaths and injuries resulting therefrom make advisable a less narrow treatment of the whole subject than that followed in mere inquests or in the ordinary official investigation of a train accident.

This commission has heretofore expressed in strong terms its condemnation of the management of this railroad. In the "New England investigation" (June 20, 1913) it said:

"If it were properly to be considered here, however, we would give weight to the suggestion that the merger has so overloaded the executive heads of the entire aggregation as to impair not only the correct and economical financial administration, but also the efficiency and safety of operation." . . . In reports on previous accidents on this railroad, defects of management, neglect of obvious precautions for safety, ineffective rules and . . . a general weakness of discipline, have been denounced and condemned. It is astounding that this state of affairs is allowed to continue to exist.

The directors of this railroad as shown in Poor's Manual for 1912 were:

William Rockefeller, New York, N. Y.	A. Heaton Robertson, New Haven, Conn.
J. Pierpont Morgan, New York, N. Y.	Frederick F. Brewster, New Haven, Conn.

George Macculloch Miller, New York, N. Y.
Lewis Cass Ledyard, New York, N. Y.
Charles M. Pratt, New York, N. Y.
George F. Baker, New York, N. Y.
Nathaniel Thayer, Boston, Mass.
Amory A. Lawrence, Boston, Mass.
Alexander Cochrane, Boston, Mass.
Charles F. Brooker, Ansonia, Conn.
George J. Brush, New Haven, Conn.
Charles S. Mellen, New Haven, Conn.
James S. Hemingway, New Haven, Conn.
I. De Ver Warner, Bridgeport, Conn.
Edwin Milner, Moosup, Conn.
William Skinner, Holyoke, Mass.
D. Newton Barney, Farmington, Conn.
Robert W. Taft, Providence, R. I.
James S. Elton, Waterbury, Conn.
James McCrea, Philadelphia, Pa.
Thomas De Witt Cuyler, Philadelphia, Pa.
Henry K. McHarg, Stamford, Conn.
John L. Billard, Meriden, Conn.
F. F. Maxwell, Rockville, Conn.
Edward Milligan, Hartford, Conn.

The manual for 1913 shows the same list, with the exception that the names of Nathaniel Thayer, Amory A. Lawrence, George J. Brush, and James McCrea do not appear, and the following names have been added:

T. N. Vail, Boston, Mass.
S. W. Winslow, Boston, Mass.
A. S. May, Bridgeport, Conn.
Samuel Rea, Philadelphia, Pa.

On this directorate were and are men whom the confiding public recognize as magicians in the art of finance and wizards in the construction, operation, and consolidation of great systems of railroads. The public therefore rested secure that with the knowledge of the railroad art possessed by such men investments and travel should both be safe. Experience has shown that this reliance of the public was not justified as to either finance or safety.

In view of the focusing of public attention upon the question of safety in the operation of this railroad, and in view of the frequent governmental inquiries, both national and state, as to the causes of and remedies for the frequent disastrous accidents, it would seem as if the directors themselves would feel called upon to turn from the consideration of the financial questions in which this road is involved and for a time at least give the benefit of their consideration and judgment to the question of safety.

But the directors do not seem to have acted upon the subject until October 17, 1912, which was after the Westport wreck, which followed that at Bridgeport in July, 1911. They then voted that the president "should make the most searching investigation into the competency of engineers employed by the road," and "that nothing be left undone which, in the judgment of himself and his associates, will conduce to greater safety in the operation of the railroad, and that there shall be no limitation placed upon the installation of signals, safety appliances, or anything else which will in his judgment or that of his associates improve the safety of passenger travel upon this company's lines." The president was never apparently called upon, nor was any other official of the railroad, to present to the directors any result of such searching investigation as had been authorized, or to get any information as to what particular action had been or was to be taken to "conduce to greater safety."

The directors assumed to dispose of their whole responsibility on this subject by a vote depositing it in bulk upon the president, and thereafter, as far as appears from the records, made no further inquiry and took no further action, although in quick succession these disasters continued.

This typifies the whole situation. They assumed the vote was self-enforcing. The president, general manager, and superintendents issued orders that all rules should be obeyed, and that employees should take all precautions for safety. But no intelligent system was devised by which to ascertain when rules were disobeyed. Rules were disobeyed largely, and only a small proportion of these violations was made the subject matter of reports to officials.

Of some of the rules, as has recently been said by the general manager of this railroad when he issued new ones in their place, there had been "convincing demonstration" of their inadequacy.

Dereliction of duty by those who are charged with the making and with the enforcement of safety regulations can not fail to weaken respect for all rules and to render nugatory to a large extent all efforts to maintain effective discipline. Rules that are not intended to be enforced have no proper place in a railroad company's code of regulations, and when the operating officers of a railroad permit rules which have been established to secure safety to be violated with impunity, they can not reasonably expect to escape responsibility for the consequences of such violations.

"Man failure" in this case began high up in official authority, and it was not an unnatural sequence that it reached down to those in positions lower in official rank, but still weighted with great responsibility. Discipline was weak and ineffective, certainly a fault of the management. Rules were inefficient, a fault of the higher officials. Rules were inadequately enforced, the blame for which must be charged to the officials. And while all this was true, high speed was required. And this high speed was required over the section of road where this accident occurred, while there were in use antiquated signals which were condemned by the locomotive enginemen as well as by the public service commission of Connecticut.

There was an imperative call arising from the density of traffic and complex operating conditions on this railroad for close and intensive superintendence. This call was unanswered until after the public hearing in this case. The proper spacing of the trains was a matter for which not the train employees but the management of the railroad was responsible.

It is not necessary here to attempt to outline the technical rule of law governing the obligation of directors as trustees for the corporation, for the aggregate body of their stockholders, and for the public. Suffice it to say that there can be little doubt that this legal obligation is more stringent than seems to be the generally accepted belief of many men of large fortunes who occupy many positions of this character.

The rule is that where a corporation is handling agencies dangerous to life, its directors are required to exercise such reasonable supervision over the management of their company's business as will result in the observance of the utmost care on the part of subordinates. Directors by law are not mere figureheads, nor are their duties confined to the mere direction of the finances of a corporation. Their duties are such that mere delegation of them, if they are not in fact performed, does not satisfy the legal obligation unless there has been ordinary business care and diligence in supervision.

The duty of safeguarding against the hazards inhering in this business can not be divested from themselves by a mere vote delegating it upon another unless there is an exercise of the legal standard of care and diligence in supervision to ascertain and know that it is performed.

When public calamities call their attention to the nonperformance of the duty of safeguarding this enterprise, where governmental authorities call public attention to the necessity of further safeguards, it seems some further action by the directors of a railroad upon which such calamities are recurring is called for than a formal reaffirmation of a vote delegating the whole safety question to one official.

The safety problem of this railroad is primarily a question for itself. If governmental interference and action is called for it results from the inaction of the corporation itself. The Government, through the enactment of legislation by Congress, has the power, if this railroad will not itself exercise its own authority in the premises, to compel the safeguarding of traffic over this line.

By what we have said with respect to the duty of supervision resting upon the directors and the duty of managing officials to provide for the safeguarding of traffic we do not mean to palliate in any degree the disobedience of rules by the trainmen and enginemen hereinbefore named and commented on. When employees undertake the dangerous employment of railroading it is their duty to familiarize themselves with all the operating rules. Disobedience of these rules where they are specifically applicable carries with it full responsibility for consequences.

It can not be too strongly impressed upon railroad employees

that they are most strictly bound to comply with all safety rules provided by the railroad for their guidance. No matter how many contributing causes there may be for which others may properly be held answerable, the direct and proximate cause of this disaster was the failure of those members of these train crews before referred to to obey rules and to exercise the degree of care under the circumstances which was commensurate with the grave responsibility resting upon them at the time.

Our reference to the management of this railroad in the past, of course, has no application to the new president, who was confronted with this accident on the day he took charge. Presumably he was selected because of his ability and fitness as a railroad manager. It is to be hoped that he may be permitted to devote himself primarily to the problems of safety of operation which this railroad management is now under the highest compulsion of duty and humanity properly to solve.

Congress has made it the duty of this commission to investigate and report upon railway accidents and to make such recommendations as circumstances may require, but there has been no legislation by which such recommendations may be enforced. It is manifest that so long as compliance with the commission's recommendations remains discretionary the entire subject of safety of operation must remain dependent only upon the carrier's volition. The ignoring in whole or in part by carriers of such recommendations and the resulting fatalities potently argue that safety of operation should not be left entirely to the discretion of any railroad, but, in the light of recent disasters, would seem to be a subject over which Congress well might exercise its full authority, including the fixing of some definite time within which all high-speed passenger trains shall be required to be made up exclusively of all-steel cars. Such recommendations as the commission may deem proper in these premises will be submitted to Congress in the commission's forthcoming annual report.

The density of traffic on this railroad requires an adequate block-signal system, and until the system now being installed between Springfield and New Haven is available for use an adequate method of providing a proper space interval between trains should forthwith be placed in operation.

Definite instructions should be issued to enginemen and trainmen to approach signals in weather so foggy or stormy as to obscure in any degree the clear view of signals with train under full control. Such instructions should also be enforced.

An adequate system of superintendence and supervision should be immediately arranged which will give those in authority definite and positive information as to whether or not the safety requirements and rules of this railroad are observed.

ENGLISH BAGGAGE RATES INCREASED.—An increase in the charges for excess baggage, passengers' baggage in advance, carted baggage and bullion and specie, to take effect January 1 next, is announced by the English railway clearing house. The notice is issued on behalf of all the railways of the United Kingdom represented by the clearing house, and a separate notice is published by the South Eastern & Chatham. In July, the managing committee obtained the provisional sanction of the Railway and Canal Commission to substitute the clearing house scale of parcels at company's risk for the very low scale then prevailing on its system, and also to raise the owner's risk parcels rates. The increase in both cases was about 4 per cent., and the new scales were put in force on August 1. Like the other railways, the South Eastern & Chatham now proposes to raise the present parcels rates for bullion and specie by 25 per cent., the charge for passengers' baggage in advance from 24 cents to 27 cents per package within the usual free cartage area, and from 30 cents to 33 cents per package outside such area, and the charge for carted baggage from 12 cents to 18 cents per package. For ordinary excess baggage the present rates per pound in England and for traffic between England and Scotland are: Up to 50 miles ½ cent, 51 to 150 miles 1 cent, 151 to 300 miles 1½ cent, and over 300 miles 2 cents per lb.

CONNECTICUT REPORT ON NORTH HAVEN COLLISION.

The Public Utilities Commission of Connecticut has issued the report of its engineer, C. C. Elwell, on this collision, and supplements the report with its own conclusions, from which we quote as follows:

"We feel it but just to state in connection with this accident that the officers of the company exercised extraordinary care and caution in preparation for handling the heavy travel anticipated over Labor Day by issuing bulletins and special warnings and instructions to all men operating trains.

"The two trains involved in this accident were made up entirely of wooden cars. What would have been the result if of steel construction is more or less problematic, but it is generally conceded that steel cars should be substituted for the wooden cars as rapidly as possible. This, however, may be found to require heavier roadbed and bridge construction to sustain their additional weight. . . . All express trains operated over the New Haven system in Connecticut are interstate and in the matter of type of construction come wholly under the supervision of the Interstate Commerce Commission. . . .

"The question of automatic train control was very carefully considered by 'The Block Signal and Train Control Board' of the Interstate Commerce Commission and is now a subject of careful study and investigation by a number of leading railroads . . . but mechanical devices can never entirely take the place of men who are true and loyal to every duty.

"The existence of harmony, loyalty and strict discipline is absolutely essential for the safe and successful operation of trains. There appears to be a general feeling, more or less well founded, that these elements are lacking on the New Haven system between the company and its several classes of employees.

"The commission will not at this time, with only a limited investigation, undertake to state the cause or prescribe the remedy, but the following facts as to past conditions may have had their influence and may suggest at least a partial remedy:

"In 1898 the system was divided into nineteen divisions, each in charge of a superintendent.

"In 1901 the number of divisions was reduced to twelve; in 1908 the number was further reduced to seven, and about a year later to six. The average number of miles of main line handled by a division superintendent is now 332.89.

The Shore Line division, where this and other recent serious accidents occurred, had on September 2, 1913, 424.26 miles of main line, made up of single, double, four and six track sections, a total of 763.51 miles of main track, on a single track basis, with 464.40 miles of yard and side tracks. The total number of employees under the Shore Line division superintendent, including all classes of service, was 8,506, the superintendent being assisted by eight trainmasters who reported to and received instructions from him.

"The result of enlarging the divisions and reducing the number of superintendents has had a tendency of removing personal contact and lessening the friendly relationship between the directing and operating forces.

"Changing of divisional lines made it necessary to change train terminals and many employees who formerly had established homes were obliged to change their places of residence or 'live on the road' and be deprived of the beneficial influence of home life and environments. In cases where employees reside at a considerable distance from terminal points, much time, supposed to be and really required for rest, is occupied in 'deadheading' to and from their homes. Engineers who knew only one section of the road were required to extend their runs and to 'break in' on new territory. Many station agents and their assistants have become dissatisfied by being forced to work short handed and with inexperienced help, in order to 'keep down expenses.' . . ."

ANALYSIS OF A BROKEN RAIL.

Louisville & Nashville passenger train No. 7, southbound, was derailed October 1, 1912, near Hays Mill, Ala., resulting in the death of the express messenger and the injury of 21 passengers. This train consisted of nine cars and the cause of derailment was a broken rail. The Interstate Commerce Commission has issued a report by the chief inspector of safety appliances and by James E. Howard, engineer-physicist of the Bureau of Standards, from which the following is taken.

The fractured rail was of 80-lb. section, 33 ft. long, of open hearth steel rolled by the Tennessee Coal & Iron Company in June, 1906, and laid that fall. The receiving end of the rail remained intact for a length of 13 ft. 4 in. The leaving end was broken into a number of fragments varying in length from 36 in. to 7¼ in., 18 of which were recovered. The rail was fractured across its entire section at 14 places. At 11 of these places the metal of the head disclosed transverse fissures ranging in diameter from 0.37 to 2 in. At only three of the complete fractures was the metal exempt from the presence of these transverse fissures, which were located either on the gage side of the head or directly over the web, none being present in the outer half of the head. The minimum distance apart of adjacent fissures was 7¼ in., and the maximum distance 36 in. In turning down a section of the rail for a tensile specimen the section fell apart in the lathe when the outer metal had been turned away for a distance, disclosing another transverse fissure, while one more was found in the head of the long section of the rail when bending the head. This latter fissure had a diameter of 0.37 in. and reduced the ultimate strength of the head 36 per cent. from that shown by a corresponding bending test on a section where no internal transverse fissure existed.

The chemical specifications under which this rail was rolled, the mill analysis and the Bureau of Standards analysis of the material are as follows:

			Analysis of Rail.		
	Specifications. Per Cent.	Mill Analysis. Per Cent.	Top of head. Per Cent.	Center of head. Per Cent.	Upper part of web. Per Cent.
Carbon	0.55—0.68	0.57	0.88	0.85	0.84
Phosphorus .....(not over)	.06	.057	.051	.052	.048
Silicon .....(not over)	.20	.008	.014	.014	.019
Manganese	.80—1.10	.88	.68	.67	.67
Sulphur	.....	.040	.035	.032	.031

In discussing the rail Mr. Howard states that "it appears from the above that the carbon content of this rail was 23 per cent. higher than the upper limit of the specifications and 47 per cent. higher than the steel was reported, thus nullifying the value which might attach to the reported composition of the steel and giving such report a perfunctory character.

"Structurally the metal of this rail appeared uniform and sound. Cross sections polished and etched at six places along this length were uniform in appearance and substantially free from the dark markings which are frequently displayed by rail sections. So far as could be judged the formation and extension of these 13 transverse fissures was the result of service conditions to which the rail had been exposed in the track, not materially influenced by inequality of the steel.

"The combined bending stresses and intense wheel contact stresses which attend service conditions of a steel rail appear to constitute the features which lead to the formation and development of interior transverse fissures. Regardless of the grade or quality of the steel there must be present longitudinal strains which cause the separation of the metal of the rail in a longitudinal direction. The magnitude of those strains necessary to cause rupture will be greater or less according to the grade of metal.

"The effect of repeated alternate stresses in causing rupture in all grades of steel, without the display of ductility and under the action of fiber stresses somewhat below the elastic limit of the metal, is known. Repeated alternate bending of a steel rail, and all rails are exposed to repeated alternate bending stresses, has a tendency to cause ultimate rupture in a brittle manner under fiber stresses below the primitive elastic limit of the steel. But exposure to bending stresses alone—that is, unaccompanied by intense wheel pressures on the running surface of the head—would lead to fractures which would have their origins at the fibers most remote from the neutral axis of the rail, where the stresses would be the greatest. Under such circumstances rails would be expected to fracture, starting either at the running surface of the head or at the underside of the base.

"Since transverse fissures have their origins at the interior of the head and are longitudinal tensile fractures of the metal, it is necessary to look for a cause for the transference of the incipient place of rupture from the outside fibers to interior ones. The cold rolling of the running surface of the head by the wheels doubtless occasions this transference. The gage side of the head is most affected by the wheel loads, and that should be the side of the head to develop interior fissures, as examples of fractured rail have shown it to be.

"The effect of the wheels is to put the metal at the running surface of the head into a state of internal compression. The springing of the head into convex shape on the running side, when detached from the web, is evidence of the release of internal compression. The present rail sprung in that manner when the head was detached from the web. Herein is found a cause which has a tendency to transfer the incipient place of rupture from the surface to the interior of the head. The metal in compression at the running surface must perforce put the metal next below it in a state of tension and augment the tensile strains of the bending loads. In a way the rail is an example of unsymmetrical loading, or rather presents an unsymmetrical result of loading, with bending stresses alone affecting the base, while the head is affected by the combined bending stresses and internal strains of compression.

"It is not a question of grade of steel whether or not this action takes place, but in specific cases a question of what constitutes an overload for the particular steel being used. Rails which develop this type of fracture have certainly been overloaded. The close proximity of transverse fissures to each other precludes the explanation that they are the result of bending stresses taken alone. The results call for the presence of an independent force, the influence of which is felt along the entire length of the head, and such in fact is the manner in which the compression metal acts.

"Since these fissures occur in planes at right angles to the direction in which the rails were rolled their formation would not be looked for as a result of mill practice. Certainly the presence of fissures approaching 2 in. diameter would not be attributed to the action of the rolls of the rail mill, ignoring the fact, for the time being, that such fissures are located on one side only of the head. 'There is lack of continuity in steel in the ingot at places where slag inclusions exist, yet such globules, of one one-hundredth of an inch diameter, more or less, are drawn out in the finished rail into longitudinal filaments parallel to the length of the rail. The examination of rail steel through the successive reductions from the ingot to the rail has failed to furnish examples of incipient fissures developed at right angles to the direction of rolling.

"No method has been found capable of locating incipient interior fissures and which, it should be remarked, do not present oxidized surfaces. But so grave a matter as this should not be left in its present state of uncertainty, and data upon contributory causes, track conditions, wheel loads, and grades of steel in which these fissures appear should all be acquired. Primarily the formation of a transverse fissure is the result of an overload, for that particular rail, from whatever point the subject is viewed. It is regarded as an imperative duty, which should at once be performed, to ascertain and define the actual stresses to which the rails are daily subjected."

ELECTRIC CARRIER SYSTEM.

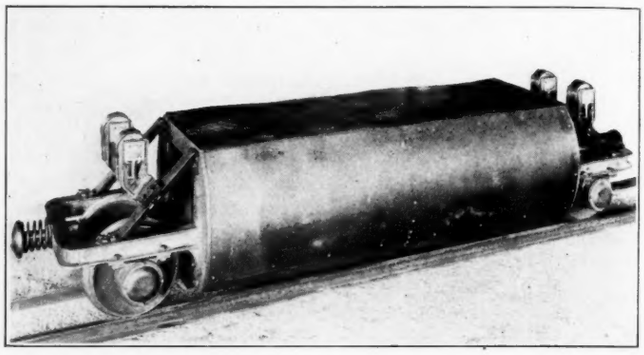
The electric carrier system is a device now being perfected to transport mail or moderate sized packages in large buildings, such as terminals, warehouses, etc., or between any points either within or outside of cities. It is exceedingly rapid and of large capacity. Two of its chief advantages are its simplicity and durability.

The system consists of three-phase, alternating current cars, running on rails through a steel or concrete tube which may be built either on the surface, on trestles, or underground. The cars are propelled by a magnetic push or pull caused by the reaction of a progressive magnetic field in an elongated motor member rigidly fixed to the track between the two rails acting on a flat motor member secured to the bottom of the car. The current is transmitted to the car by means of two overhead trolley tracks.

This system permits of the utmost simplicity in the construction of the cars as no rotary motors are necessary and there is no wheel drive. The cars are operated entirely from a central power plant, and as they all travel at a uniform speed, corresponding to the number of alternations or cycles of the power circuit, they can be run at intervals of a few seconds without danger of collision. The cars can also be run in trains, thereby materially increasing the capacity of the system. Any curve or grade that would be necessary in practical operation can be negotiated with ease and it is believed that on a long level tangent a speed of 100 miles an hour can be attained.

For the purpose of demonstrating to the government the practicability of the system for the rapid transportation of mails between terminals in large cities, a plant has been installed at Paterson, N. J., which was so designed as to comprise all the operating difficulties that would ordinarily be met with in practical operation. This plant, which is shown in one of the illustrations, consists of a 1,000 ft. circuit with two straight stretches and two curves having a 40 ft. radius; track connection with the central power house, which is also used as a terminal; and track connection with a trestle hump having a grade of 20 per cent. A portion of the track is completely enclosed in a steel tube, but the greater part is circled by rings so that the cars can be seen in operation. The track is laid with 16-lb. rails and the gage is 12 in. The diameter of the tube and rings is 36 in. The rings are two feet apart and each is fastened to a tie. The cars weigh 1,100 lbs., and their inside length is 6 ft. The only springs on the car are under the trolley wheels and on the buffers. The wheels under the car are held rigidly in position to keep the clearance between the two motor members uniform. This clearance varies from ⅛ in. to ½ in., but is usually 3/16 in. As the motor member on the track is tightly bolted at intervals of two feet and as there is no play to the motor member on the car the clearance varies only to a negligible degree. The wheels are on ball bearing axles, each wheel acting independently of the others. Empty or loaded, the cars run around the main circuit at the rate of 30 miles an hour. They were designed to carry a 300-lb. load, but it has been found that they can carry 1,000 lbs. equally well.

Arrangement of the Electric Carrier Within the Rings.



Car Used in the Electric Carrier System.

The 20 per cent. grade is negotiated without difficulty even with the 1,000-lb. load. It was found that with a running start the car will only climb one-third of this hump if the power is cut off at the base, and also that the car can climb the grade if started from a standstill at the base. The cars are under absolute control from the central power house, and can be stopped by reversing the power for a moment or slowed by reducing the voltage. The voltage used for the level stretch is 150 volts, and that for the grade, 300 volts. By means of transformers at the bases of the grades the voltage can be changed automatically. At the top of the hump two of the wires of the three-phase alternating current system are crossed so that on the down grade the cars will not gain added momentum. The cars can be operated equally well in either direction. In case the power gives out while the cars are climbing a grade, brakes will be automatically released and the cars instantly stopped. In practical operation the cars will be switched to side tracks at terminals to be loaded and unloaded. No power will be necessary for these side tracks, as the cars can be easily pushed along from the platforms. The cars will be stopped by means of friction from convex boards laid close to the rails which will press against the bottom edges of the cars. When they are ready to start they can be pushed on to the main circuit.

The circuit at Paterson has been divided into blocks, and by an automatic signaling system the location of the cars is shown on a plan of the circuit on ground glass in the power station. As a car enters a block a light shows at the corresponding point on the plan and remains lighted until the car enters the next block, when it goes out and a light is shown on the plan at beginning of the next block. By this arrangement the location of any tie-up, due to a broken rail or damaged car, can be immediately located and the cars behind can then be stopped to avoid further damage. Each block can be controlled by a separate switch so that, in case of an accident, the cars in front can continue on their journey and the cars behind the point of trouble can be brought back to the terminal from which they started. In practical operation there will be a manhole at every block so that the various sections can be easily inspected.

Maintenance costs should be low. The cars are strongly built and so simple that there is very little to get out of order.

The track is protected from the elements by the tube, and the wear on the rails will be slight because there is no wheel drive and the grinding on curves will be minimized by the fact that the wheels revolve independently of each other. Operation will be cheap because only a small staff will be necessary and the power will not be expensive.

The cost of the installation of this system with two tracks running through 36-in. tubes, completely equipped, from New York to Philadelphia, Pa., 90 miles, has been estimated as follows:

Pipe in position	$5,702,000
Power house	109,000
Right of way and trenching	540,000
Structure in the pipe (including rails, trolley tracks and motor member)	1,900,000
Block signals	100,000
Cars and trailers	23,000
	$8,375,000
Profit (15 per cent.)	1,236,000
Total cost	$9,611,000

According to these figures the cost is a little over $50,000 a mile, but the estimates are said to be high rather than low.

Electric Carrier System Demonstration Plant at Paterson, N. J.

When they were made it was thought that an elongated motor member would be necessary between the trolley tracks as well as between the rails. It has since been found that one motor member between the rails is all that is necessary. This should reduce the cost of the structure in the pipe materially. The average cost of cars and trailers is about $100 each. The estimated cost of the installation of the system, with two 36-in. tubes, underground from the Grand Central Terminal, New York, to the Pennsylvania Station, is $600,000.

According to the estimates submitted to the government, the full capacity of the last mentioned installation, running single cars at intervals of 20 seconds, would be 8,640 mail pouches each way per day. This capacity could be doubled by attaching a trailer to each car, and could be quadrupled by running trains of two cars and two trailers at intervals of 20 seconds. The maximum capacity, therefore, would be 34,560 mail pouches each way per day.

The system can be adapted to transport cars small enough to be used in large stores or large enough to run on standard-gage tracks. The principle could also be used for escalators and even elevators.

The system is being developed by the Electric Carrier Company, New York.

SIGNALING CONDITIONS ON THE PENNSYLVANIA.*

By A. H. Rudd,
Signal Engineer of the Pennsylvania Railroad.

To insure the accuracy of the indications, we are installing all our new automatic work with alternating current track circuits, because we find that current from trolley lines interferes with our direct current track circuits. There are precautionary measures that can be taken with D. C. circuits, such as double relays and cutting circuits up, which have been tried with fair success. The real cure for the foreign current is the A. C. track circuit, and we are not only installing all new work that way, but changing over some of the old. This carries with it electric lights on the signals, and A. C. motors.

The cost of installation is heavy. It runs for double track about $3,000 per block, 4,000 or 5,000 or 6,000 ft. long; for the two tracks probably $8,000 a mile. I suppose some of the cost will come out of the 5 per cent. advance in freight rates!

Operating and maintenance costs are below anything we have had before. For electro-pneumatic signals the cost of maintenance is about $160 a year per block. That on a four-track road, is $640 a mile. The D. C. motor runs about $90, and in some fortunate cases we have had $75 quoted, but we are from Missouri. The A. C. runs not over $60. That means a saving of $400 a mile over the old electro-pneumatic.

On single track in places we are using the controlled manual block, where we have a stretch of single track in a double-track line and the track is pretty hot and we have had to issue a great many orders. We put in this controlled manual, with the continuous track circuit, so that both the signalmen and the track circuit have to go wrong and the trains go wrong also before we can get them together. We are moving the trains in such places without orders, and saving a great deal of delay. The delay of holding freights for orders often knocks them out of their running time and holds them back an hour or two. With this scheme they can skin through without time table rights. We are using it on a third track in some places, and we are contemplating putting it on the two inside tracks in our four-track line in a few places so we can use three

*Extracts from an address before the Railway Club of Pittsburgh.

tracks in one direction under signals during certain parts of the day, and in the other direction during other parts of the day.

At interlockings we have elaborate electric locking. This has been developed from small beginnings. First, to obviate deficiencies of detector bars we installed electric switch locking so that when the train is on the switch it could not be moved. The train shunted the circuit and locked up the lever. Then we extended it to take in the fouling points. Then we extended it to lock the switches ahead, so that even if the switchman put the signal normal the switch would be locked until after the train passed over.

That was all right if you ran in one direction. When we tried to run a train in the other direction we could lock them up, but the switch farthest ahead, that we did not want to unlock, was the first one to unlock, and those we wanted to unlock first were the last to unlock. Mr. Anthony, assistant signal engineer, solved that problem.

After we got the switches locked up we had a case where an engineman reported that he had a clear distant which changed to caution just in front of him. He stopped just short of the home signal and found a train crossing over in front of him. Then we arranged the locking so that when a train entered the circuit 3,000 or 4,000 ft. from the distant signal it locked the levers so, though the signals could be put to stop, the route could not be changed until he had passed the home signal. That was a long step in advance. To provide for a train shifting we put in a slow release, with which two or three minutes would be required to change the route. If a man consumes three minutes between the distant and home he can stop, if the home is against him. As a substitute we used a time release, so arranged that after a signal was put normal it would take two minutes to change the route. That means that after the engine has passed it will take two minutes to let him into the siding. Recently we have developed a scheme so that we can use the time lock if the train is approaching, but release as soon as it has passed the home; so we get the quick release of the approach locking and the economy of the time locking.

For our four-track interlocking and other construction and maintenance we have appropriated this year $4,200,000.

On our Manhattan terminal, which is the best signaled piece of railroad in the world, we have automatic signals through the Hudson river tunnels in both directions, and we have automatic stops. The signals are so arranged that by throwing a lever in the big cabin at the terminal, and another at the Hackensack drawbridge, five miles away, we can reverse the traffic. If trains have been running west and have passed out of the block we lower all the automatic stops and put them out of business for westbound trains, and throw into service the automatic stops and signals for eastbound trains. We operate two or three trains that way daily in order to be sure that everything is working properly. That is the only place where we use the automatic stop. The one we are using is the Hill automatic stop, and is comprised of three parts, like all Gaul. The first part was invented by Mr. Kinsman, as near as I can get at it, and the Union Switch & Signal Company arranged for its use. I may not be right. I do not want a libel summons, but that is what I have heard. They have adapted it to the electro-pneumatic cylinder, which Mr. Kinsman did not invent. We decided that we would not put stops outside because the interference with snow and ice might be troublesome. The principal object was to prevent the angle cock on the train, which when hit opens the train line, from being interfered with by lumps of coal and crossing planks and things of that kind lying along the road. So we decided to install it in the tubes only. The committee made their recommendations to the committee on yards and terminals. And they approved it. Then it was put up to the big committee, the joint committee on the operation of the yards and stations and structures. They approved it. With all that tremendous influence back of it, it is no wonder that the vice-president and the president approved it. We equipped all our electric locomotives and all our multiple unit power and sent a trial train out on the Long Island. The first trip it struck a piece of crossing plank and got stopped; and then we made the discovery that even if we had only put the trips in the tunnels the trains that ran outside might hit things. We did not reach this conclusion by synthesis or analysis, but by hard knocks. Then Mr. Hill started to see if he could develop something, and he did.

It is a mighty ingenious proposition and is working with very satisfactory results on our trains today. So when some people tell us there is no satisfactory automatic stop we have to say that if you want that kind of thing we have just the kind of thing you want. I don't believe we want it for general use for a good many years. Where you have mixed traffic it will tie up your railroad. The conditions on the Interborough and in our tubes today are ideal for an arrangement of that kind. Trains are run at approximately the same speed and the same spacing in the rush hours, and the same class of trains and equipment, high-class passenger trains, no slow drags or shifting movements.

After we have got our roads signaled with what money we have left, after we have paid the income tax and the other taxes and the excessive expenditures which we are compelled to pay because of new laws; after we have got rid of all the grade crossings in New Jersey at our own expense and done a few other little things that need fixing, and have tried out discipline; and our safety committees have done their work; and after the enginemen have become awakened to the honor of their profession, and to the fact that good men are being imperilled when the careless and slovenly men are protected and backed up; after the men get so that they feel that they should weed out the poor men—and there are a few—with the improved discipline and improved feeling, 99 out of 100 of the accidents and collisions which might be prevented by automatic stops will be eliminated. After we have done all of those things, if our safety first movement will not take care of the balance then I think the time will come to try, not automatic stops which apply the emergency, but a speed control that will take care of the speed as soon as it reaches a given limit.

PASSENGER TRAFFIC IN THE UNITED KINGDOM.—The returns for the railways of the United Kingdom for 1912 show that the total number of passengers carried, excluding season-ticket holders, was 1,294,337,000, as compared with 1,326,317,000 in 1911. The abolition of second-class fares on a number of the railways caused a very large transfer of passengers to the third class, but, nevertheless, there was a decrease in the number of third-class passengers of 21,216,000. There was a loss of 10,612,000 in the number of second-class passengers and a slight falling off in the number of those paying the highest fares. A partial explanation, at least, of the decrease in the number of passengers carried in 1912 was the disorganization of the railways for some weeks by the great coal strike. A further explanation, which will evidently be more potent as the years pass, was the increase in the motor-omnibus and tramway services and the wider use of motor cars generally. In 1910, for example, the third-class railway passengers in the United Kingdom showed an increase of 43,000,000 over 1909, while the tramways showed an increase of 163,000,000 for the same period. In 1911 there was an increase of 21,000,000 in the number of third-class passengers carried on the railways of the United Kingdom, but there was an increase of 220,000,000 in the number of tramway passengers. Effort is now being made to establish what is designated as a greater omnibus service between London and the important towns and resorts within a radius of 50 miles from the metropolis. Extensions of omnibus routes are also taking place in many other parts of the United Kingdom.

TRAIN ACCIDENTS IN AUGUST.[1]

Following is a list of the most notable train accidents that occurred on railways of the United States in the month of August, 1913:

Collisions.

Date.	Road.	Place.	Kind of Accident.	Kind of Train.	Kil'd.	Inj'd.
12.	Chicago, R. I. & P...	Richfield.	rc.	P. & F.	0	43
13.	Wabash	Millard.	bc.	P. & F.	1	7
23.	St. Louis & S. F....	Newburg.	rc.	P. & P.	0	26
†24.	Georgia	Decatur.	rc.	F. & P.	1	37
24.	Oregon S. L.....	Virginia.	rc.	F. & F.	0	1

Derailments.

Date.	Road.	Place.	Cause of Derailm't.	Kind of Train.	Kil'd.	Inj'd.
5.	Wabash	Runnels, Ia.	cow.	F.	1	2
5.	Central Ga.	Oliver.	acc. obst.	P.	0	14
6.	Nashville, C. & St. L.	Marietta.	flood.	F.	4	0
8.	Texas & Pacific.....	Mingo.	unx.	F.	4	1
14.	Chi., M. & St. P.....	Burgoyne.	boiler.	F.	2	2
†19.	Great Nor.	Crary, N. D.	d. eq.	P.	2	36
19.	St. Louis & S. F....	Jensen, Ark.	unx.	P.	0	17
21.	Illinois C.	Bogue Chitto.	d. frog.	P.	0	3
22.	Penn.	Leetonia, O.	d. truck..	P.	0	8
23.	St. Louis, I. M.....	Marche.	burnt bdge.	F.	1	2
26.	Ches. & Ohio.....	Bremo.	bad load.	P.	..	16
27.	Toledo & O. C.....	Peoria.	neg.	F.	1	0
28.	Galv., H. & S. A....	Harwood.	exc. speed	P.	0	15

The trains in collision at Richfield, Neb., about midnight on the morning of the 12th, were an eastbound train carrying a circus and passenger train, second No. 6. The circus train had entered the side track to be passed by the passenger train, but had not cleared the main line, and had not flagged the passenger train. Forty-three employees of the circus were injured.

The trains in collision at Millard, Mo., on the 13th, were northbound passenger No. 1 and a southbound freight. The passenger ran over a misplaced switch and into the head of the freight, which was standing on a side track. The engineman of the freight was killed and the fireman and six passengers were injured. The responsibility for the collision is laid on the head brakeman of the freight train, who became confused and threw the switch for the siding. This man soon after disappeared.

The trains in collision at Newburg, Mo., on the 23rd, were eastbound passenger trains. Twenty-five passengers and one employee were injured. The cause of the collision was the failure of the flagman of the leading train to protect by flag.

The trains in collision near Decatur, Ga., on the morning of the 24th, were westbound passenger No. 3 and westbound freight No. 19, the freight running into the passenger just as it was starting away from the station. One passenger was killed and 37 were injured. The freight engine penetrated the rear car of the passenger train about 5 ft. The freight train had encroached on the time of the passenger.

The train derailed near Runnels, Iowa, at 4 a. m. on the 5th, was an eastbound freight. The fireman was killed and two other trainmen were injured. The engine of the train was overturned and ditched by striking a cow.

The train derailed at Oliver, Ga., on the 5th, was eastbound passenger No. 4. Nine passengers, two trainmen and three other persons were injured. The cause of the derailment was some accidental obstruction in a frog after the engine had passed it safely.

The train derailed near Marietta, Ga., on the 6th of August, was a fast southbound freight, and the engine and 14 cars were wrecked. Three trainmen and a trespasser were killed. The derailment occurred at 1 a. m., and was due to the destruction of a reinforced concrete culvert by a flood.

The train derailed near Mingo, Tex., on the 8th was a northbound freight of the Missouri, Kansas & Texas, and 13 cars were ditched. Two trainmen and two trespassers were killed, and one trainman was injured. The cause of the derailment was not discovered.

The train derailed near Burgoyne, Mont., on the 14th, was a westbound freight, and the cause of the derailment was the explosion of the boiler of the locomotive, due to low water. The conductor and the engineman were killed and the fireman and one brakeman were injured.

The train derailed at Crary, N. D., on the 19th, was the westbound Oriental Limited. Two tramps were killed and 35 passengers and one employee were injured. The smoking car was forced violently against a grain elevator, partly demolishing the building. The wreck took fire from coals in the locomotive; and the mail car, baggage car and two passenger cars were damaged by fire. The cause of the derailment was the breakage of the equalizer between the driving and trailing wheels of the engine, the parts of which fell to the track.

The train derailed at Bogue Chitto, Miss., on the 21st, was a northbound passenger. The tender jumped the track at a frog and the first two cars fell down a bank. Three passengers were injured. The cause of the derailment was a defect in the frog.

The train derailed near Leetonia, Ohio, on the morning of the 22nd, was eastbound passenger No. 8 and eight passengers were injured. The cause of the derailment was a broken spring hanger in the truck of a passenger car.

The train derailed at Marche, Ark., on the 23rd, was an eastbound freight. The engineman was killed and two other trainmen were injured. The cause of the derailment was the weakening of a bridge by fire, the location of the bridge being such that the engineman, approaching it, did not see the danger. The wreck took fire and five loaded cars were burnt up.

The train derailed near Bremo, Va., on the 26th, was a freight and passenger combined, eastbound. The conductor, the porter and 14 passengers were injured. Two passenger cars and three freight cars fell down a bank. The cause of the derailment was the top heaviness of a carload of wood. It rocked off on a curve of 5 deg.

The train derailed near Peoria, Ohio, on the 27th, was a southbound freight. The engineman was killed. The train entered a siding at uncontrolled speed.

The train derailed at Harwood, Tex., on the 28th, was passenger train No. 2. Thirteen passengers and two employees were injured, none seriously. Of the two engines drawing the train the leading engine remained on the track. The cause of the derailment was excessive speed.

[1]Abbreviations and marks used in Accident List:
rc. Rear collision——bc, Butting collision——xc, Other collisions——b, Broken——d, Defective——unf, Unforeseen obstruction——unx, Unexplained——derail, Open derailing switch——ms, Misplaced switch——acc. obst., Accidental obstruction——malice, Malicious obstruction of track, etc. ——boiler, Explosion of locomotive on road——fire, Cars burned while running——P. or Pass., Passenger train——F. or Ft., Freight train (including empty engines, work trains, etc.)——Asterisk, Wreck wholly or partly destroyed by fire——Dagger, One or more passengers killed.

TRANSANDINE RAILWAY DIFFICULTIES.—The Transandine railways have recently come in for a great deal of criticism and discussion in the Chilian senate in reference to differences arising with the Argentine Great Western and Buenos Ayres & Pacific. It is alleged that although the Chilian government grants a subvention of $150,000 to the Chilian section of the Transandine railway, the tariffs imposed by the Argentine railways in question put rather a severe check on the movement of Chilian products entering into competition in the Argentine markets with similar products grown on the zone served by the two companies. The Chilian senators are not satisfied with the benefits resulting from passenger, postal and baggage transportation. They suggest that the only possible solution is the expropriation of the Chilian section by the Chilian government. Should this be achieved it is hoped that works to prevent the blocking of through traffic may be taken in hand. On the Argentine side the Buenos Ayres & Pacific has done everything to expedite traffic. On the Chilian side the hotel keepers benefit, since during a heavy fall of snow it is not possible to leave the Chilian borders.

General News.

The state's attorney and the coroner at New Haven are reported as having decided not to begin any criminal prosecution of officers of the New Haven road on account of the North Haven collision.

The Missouri, Kansas & Texas is putting fire-extinguishing apparatus on about 100 locomotives in service in Oklahoma and Texas. Each engine will have a fire pump and 500 ft. of two-ply cotton hose.

Governor Dunne, of Illinois, has asked the presidents of all railways in the state to send representatives to attend a conference in his office on Saturday of this week, to discuss the subject of grade crossing accidents.

"Safety First," as related particularly to the habits of trespassers walking along the tracks, is the subject of an article in the last *Outlook* by Marcus A. Dow, of the New York Central. The feature of the article is a series of striking pictures showing how all sorts of people make a thoroughfare of the railroad tracks.

A press despatch from Jackson, O., September 26, reported that, as the result of action of the State Inspector of Boilers in condemning twenty locomotives of the Detroit, Toledo & Ironton, the entire system between Jackson and Springfield, 111 miles, was at a standstill. Four hundred cars loaded with coal were lying in the Jackson yards.

A number of the shorter railroads of the southeastern states have formed an association with a view to promoting their mutual interests; and at Atlanta, September 23, an organization was formed with J. W. Oglesby, president of the South Georgia Railway, as president. C. B. Lucas, traffic manager of the Valdosta, Moultrie & Western, Valdosta, Ga., is secretary.

Two all-steel business cars to be used by officers of the Pennsylvania Railroad to transact railroad business while traveling, will soon be finished at the Altoona shops. By the use of the business cars last year Pennsylvania officers, while traveling 159,517 miles, were able to conduct the affairs of the railroad just as if they had been in their own offices. With these cars finished, the Pennsylvania will have four steel office cars.

Charles J. Doherty, the engineman who figured in the fatal collision at Stamford, Conn., June 11, died at his home in New Haven, September 26, the cause being heart failure. Doherty had secured employment, running a stationary engine, but his nervous system was broken down by his grief over the wreck. He could not sleep at night, and often kept his small children up because of his distress at being left alone. He leaves a widow and two children.

The office of the Weather Bureau at Washington has issued a memorandum concerning the floods which occurred in Ohio and Indiana last March and it is estimated that the total money loss by these floods was $163,000,000. This includes loss to railroad, telegraph and telephone lines and to farms and farm property, including prospective crops. The latter alone amounted to about $11,000,000. Of the total amount more than 70 per cent. was sustained in Ohio and Indiana.

At a meeting in Chicago on September 28, representatives of the Brotherhood of Railway Car Men, one of the organizations which struck on the Illinois Central and the Harriman Lines, two years ago, appointed a committee to go to Washington and present evidence concerning the strike to the new federal industrial commission recently appointed by President Wilson. Press reports are not entirely clear as to what it is purposed to accomplish, except that the commission is expected "to right industrial wrongs."

Train No. 7 of the Alabama Great Southern was stopped by robbers near Cottondale, Alabama, on the morning of September 26, and the mail car and express car were robbed, dynamite being used. The bandits, who are said to have been under 20 years old, detached the engine and express and mail cars from the train and ran them forward some distance. After finishing their robbery they started this part of the train forward, and then, jumping off, left it to run uncontrolled several miles. It stopped, however, without doing damage.

Special agents employed by the Illinois Central have discovered a new plan for getting money out of the treasury of the railroad. The company's trains have in the past few days killed two mules near Independence, La. Investigation showed that both animals had been tied to the tracks. The supposition is that the owners did the tying, and that they intended to file a claim against the railroad, but that their plans were defeated when they discovered that pieces of the rope had been found.

A conference was held at Chicago on September 24, between members of a sub-committee on weighing of the Committee on Relations Between Railways of the American Railway Association and the committee of the National Industrial Traffic League on weighing, together with J. T. Marchand, the attorney who represented the Interstate Commerce Commission in the weighing investigation. The conference was held for the purpose of bringing about an agreement on a number of rules regarding weighing matters covered in the recent decision of the Interstate Commerce Commission. With a view to defining more closely the points at issue the conference was adjourned to October 17, in New York, the day following the meeting of the Committee on Relations Between Railways.

Washington despatches report Commissioner McChord as engaged in drafting bills to be presented to Congress looking to more detailed regulation of railroads, in the matter of safety, by the federal government. Bills are also being drawn by one or more members of the House Committee on interstate and foreign commerce. This committee last week listened to the claims of a number of inventors of so-called safety devices. Chairman Adamson, of this committee, is reported as saying: "For five or six years we have been hoping the railroads would themselves take action without new legislation. At present the committee believes it may be proper to give the commission power to tell railroads when and where they must install safety appliances, block signals, steel cars, and make improvements in their roadbed. If railroads run trains too close together the commission might properly be authorized to stop the practice."

A New Sub-head for the Expense Account.

According to press reports, the Lake Superior Terminal & Transfer Railway has been ordered to pay $25 a month alimony to the divorced wife of one of its employees who was killed in an accident ten days after the divorce was obtained. The court had awarded the wife $25 a month alimony and the State Industrial Commission has issued a ruling ordering the railroad to pay the amount in lieu of damages.

Record-Breaking Monoplane Flight.

At Rheims, France, September 29, Maurice Prevost, flying over a circular course, in a monoplane, traversed a distance of 124.28 miles in 59 minutes, 45.6 seconds, or at the rate of 124.58 miles an hour. The length of the circular course is 6.213 miles, and Prevost made one circuit in 2 minutes 56.6 seconds.

Association for the Reduction of the Number of Railway Accidents.

This is the title of an organization reported to have been organized at Berlin, Germany, by former railway employees. Its object is "to bring about improvements in signaling and safety apparatus and to encourage inventors by financial support." Members of the association include men and women. They will contribute as annual dues "any amount they can afford."

The foregoing is from a paper which prints "all the news . . ." —regardless, in many cases, of the obvious silliness of the alleged news.

Lehigh Valley Employees' Relief.

The Lehigh Valley Railroad during the last fiscal year contributed $56,991.34 to its Employees' Relief Fund, making the total amount paid into this fund during the year $113,982.68. Three or four times a year—whenever the total amount in the fund drops below a specified figure—a call is made for contributions from all employees who wish to participate. There is nothing compulsory about it. Any employee may pay into it any sum up to the total of one day's pay, with a maximum of $3. For every dollar an employee pays in, the company pays another dollar. It also agrees to assume all the bookkeeping and other

administrative expenses. The right to participate in the fund's benefits continues until a new call has been made.

A member who is hurt while at his duties will receive three-quarters of the amount he subscribed at the time of the call, for every day he is unable to work. A man who paid $3 when the call was made will receive $2.25 a day until he can go back to work. The widow or dependents of a member who is killed while working for the company will receive the same amount, a daily allowance of three-quarters of the amount paid in, for two years.

All Tramps Jailed.

The "Lake Shore push" is that vague horde of tramps and hoboes who line the tracks along the river and lake, vividly described in the books of "Josiah Flynt." They have had their way for many years, but at last a man has arisen with a plan for doing away with them. Police Judge Austin, of Toledo, has started in to give every vagrant that comes before him a flat sentence of 30 days. He is not asked to get out of town, for that means only trouble for some other municipality. The judge wants a conference of the cities from Detroit to Buffalo, to devise plans for systematic, drastic severity with mere tramps. Certainly the old scheme of merely urging the wayfarer on to the next town has not worked.

The tramp evil has been one to which we have submitted, because we have had it so long. There are many such evils, which the new growth of the cities will not endure. Judge Austin's plan for co-operation deserves to be considered by every city.—*Detroit Journal.*

A Railroad Commissioner's Platform.

Frank N. Julian, a member of the State Railroad Commission of Alabama, announces that he is a candidate for re-election, and in a long statement printed in a Montgomery paper, says:

"During my two and one-half years' service on the commission 118 cases have been docketed and disposed of; of this number 40 per cent. have been initiated by the commission. This only refers to cases docketed. The number of complaints filed and adjusted without formal hearings has been four times greater than ever before in the history of the commission. This is but one evidence that the commission is serving the people to a greater extent than ever before since its establishment.

"More new depots have been built and others renovated, repaired and improved than within the same period in the past.

"More passenger trains have been put into service and the schedules and train accommodations are much better than heretofore.

"Rates, both freight and passenger, have been equalized and put on a parity with rates of our neighboring states.

"Much hard work is before the commission, now that the courts have sustained our authority, and the commission is engaged in investigations to see that Alabama is permitted to enjoy 'equal rights,' in rates and service, with other states.

"In view of the vast amount of work now before the commission, and in sight, it may be that I will be prevented, by reason of my official duties, from engaging in an active campaign, but I feel that the official who is attending to the duties of the office which he holds will be given due credit, and that my friends will see that my interests are cared for in the approaching primary."

Railway Course at University of Minnesota.

The University of Minnesota has announced an evening course in railroad traffic and rates to be given at Minneapolis during the coming winter. It is designed to provide railway men and traffic clerks of shipping houses with instructions regarding the technical and detailed work of those who have to do with railroad traffic and rate making. The course will be under the direction of Professor G. A. Gesell, of the Department of Economics of the University, and Lee Kuempel, chief clerk of the freight traffic department of the Soo Line. Among the subjects to be treated are the following: Theory of Railroad Rates; Freight Classifications; "Make up" of Tariffs; Authorities under which Joint Tariffs Are Published; Rail and Water versus All-Rail Rates; Basis for Principal Present-Day Rates; Car Service and Efficiency; Accounting of Freight Revenue; Fast Freight Lines, Tariffs and Guide of Billing Books; Privileges; "Transit and Storage"; Principal Commodity Rates—Lumber, Grain Products, Live Stock, etc.; Conditions Governing the Proper Issuance of Bills of Lading; Tracing of Freight; Methods of Compiling and Presenting Claims; Conditions Imposed by Federal and State Laws on the Acceptance of Freight; Study of the Conference Rulings of the I. C. C.; Federal Control; Interstate Commerce Act of 1887, Elkins Amendments 1903, Hepburn Act 1906, Mann Act 1910; State Control: Conflict of Federal and State Control.

The Noise Nuisance.

A cartoon in the *Ohio State Journal* depicts a citizen in his bed trying to sleep, but he is disturbed by nightmares of noisy night freight trains; and the title of the picture is "Hell."

Fostorians are not so much disturbed by trains, because they run at night, but because of their conduct. The useless jangling of bells and the shrieking of whistles, whether by day or night, is what we have to complain of. These unnecessary noises are bad enough on the nerves of well people; how they affect the sick we can only conjecture. Railroads that act boisterously after dark can be disciplined just as easily as other nocturnal disturbers.—*Fostoria (Ohio) Times.*

The New Jersey & Pennsylvania.

Owing to lack of funds to make improvements and repairs ordered by the State Board of Public Utilities, the New Jersey & Pennsylvania Railroad (formerly the Rockaway Valley) running between Whitehouse, N. J., and Morristown, twenty-seven miles, has announced that it will discontinue operations after October 5.

Fredrick V. Pitney, of Morristown, receiver of the road, appeared before the Utility Board to explain that the Court of Chancery would not permit the issue of receiver's certificates, on the ground that such action would be unfair to the bondholders. The only way to raise money and continue the road, he said, would be by having somebody supply the money without security, and this no one was willing to do.

The Baltimore & Ohio Staff Meeting.

The meeting—it might be called a mass meeting—of officers of the Baltimore & Ohio, the announcement of which was noticed recently, was held at Deer Park, Md., September 22 and 23, about 300 officers being present.

President Daniel Willard, addressing his fellow officers, said, in part:

Since the staff meeting, held when the general scheme of improvements was adopted, there has been expended in betterments on the whole system $100,000,000. Miles of new track have been constructed, mountains have been torn away to provide low grades, tunnels have been eliminated, safety appliances have been installed, and hundreds of passenger cars and locomotives of all types as well as thousands of freight cars have been added to the service.

As a result in part of this large expenditure the earnings for the last fiscal year were in excess of $101,000,000. The company has spent $40,000,000 in the betterment of the physical condition of the property, with about $10,000,000 under way, and $47,000,000 in the purchase of new equipment, station improvements and other work which brings the total expenditures close to $100,000,000. With favorable conditions obtaining, the hope of the management is to continue this program at the rate of $15,000,000 annually for the next five years.

The stock of the Baltimore & Ohio today represents an investment of 100 cents on every dollar. Drawing a parallel between the railroads and other business enterprises, Mr. Willard compared the rate of interest obtainable through investment in industrial and manufacturing securities and pointed to the fact that the railroads, in order to retain their position in the eyes of the investing public, must bear evidence of the stability of their securities from an investment standpoint. It is the policy of the B. & O. that any surplus above 6 per cent shall be returned to the property in the form of betterments. If for any reason there should be a failure on the part of the government to grant increases in rates, the railroads would be in exactly the same position as the head of a household desiring to make improvements, but lacking sufficient funds. It would mean, figuratively, that instead of putting on a new roof the leak would be patched and instead of renewing the fence the pickets would be repaired. Efficiency in the operation of trains and the handling

of tonnage means reduced cost of transportation. The average train load on the Baltimore & Ohio today is 680 tons, or an increase of 50 per cent. in three years. Economy in the use of material and supplies also means efficiency and such apparently trivial items as the saving of a single shovelful of coal by a locomotive fireman on each mile run would mean a large saving to the company in its fuel bills. . . .

Railway Earnings for 1912-13.

According to figures compiled by Slason Thompson, director of the Bureau of Railway News and Statistics, Chicago, the total operating revenues of the railways of the United States for the fiscal year ending June 30, 1913, amounted to $3,171,445,992, and operating expenses to $2,200,991,281. Taxes absorbed $129,581,478, leaving a net income of $840,873,233. This represents an increase of $79,452,973 over 1912 in total operating revenues, but only $4,940,945 over the net income of 1910. Meanwhile, over 10,000 miles of line, and 25,000 miles of track have been added to American railways.

Mr. Thompson's figures, with comparisons for the preceding two years, are as follows:

SUMMARY OF REVENUES AND EXPENSES OF THE RAILWAYS OF THE UNITED STATES.

	1910-11.	1911-12.	1912-13.
Average miles operated	244,476	246,511	248,817
Operating revenues:			
Freight	$1,925,950,887	$1,975,747,267	$2,211,814,665
Per cent. of earnings	69.04	68.76	69.74
Passenger	657,638,291	663,838,648	703,251,936
Per cent. of earnings	23.57	23.10	22.17
Other transportation	179,278,701	204,123,560	221,408,484
Per cent. of earnings	6.43	7.11	6.98
Non-transportation revenue	26,893,790	29,570,510	35,072,407
Per cent. of earnings	.96	1.03	1.11
Total operating revenues	$2,789,761,669	$2,873,279,985	$3,171,445,992
Operating expenses:			
Maintenance of W. and S.	366,025,262	364,865,825	423,872,363
Ratio to revenue	13.12	12.70	13.36
Maintenance of equipment	428,367,306	454,197,495	520,677,293
Ratio to revenue	15.35	15.81	16.42
Traffic	59,166,364	61,254,807	63,723,219
Ratio to revenue	2.12	2.13	2.01
Transportation	987,382,108	1,036,724,407	1,116,553,224
Ratio to revenue	35.40	36.08	35.21
General	73,689,373	73,019,447	76,194,182
Ratio to revenue	2.64	2.54	2.40
Total operating expenses	$1,915,054,005	$1,990,061,981	$2,200,991,281
Ratio to revenue	68.64	69.26	69.40
Net operating revenue	874,707,664	883,218,004	970,454,711
Ratio to revenue	31.36	30.74	30.60
Net revenue from outside operations	1,815,193	1,243,319	1,576,103
Taxes	108,219,512	121,797,743	129,581,478
Ratio to revenue	3.88	4.24	4.09
Net operating income	768,303,345	762,663,579	842,409,336
Ratio to revenue	27.55	26.53	26.56
Per mile of line	3,143	3,094	3,384
Permanent improvements	62,685,878	52,369,258	Not reported yet

In commenting on the results shown for the year Mr. Thompson says in part: "Once more the revenues of the railways of the United States show a normal increase for the year attended by such an abnormal increase in operating expenses and taxes as to result in a net income wholly inadequate to meet the pressing transportation demands of the American people. It is difficult, however, to impress the popular mind with the idea that anything can be badly out of joint with an industry whose gross annual earnings show continuous gains and have to be expressed in terms of billions of dollars. Every month and twice a year the press records record revenues in the headlines on the front page, and buries the operating cost and net figures among the reading notices on the financial page.

"As a result ten persons know that the gross revenues of American railways now exceed $3,000,000,000 annually where one ever learns that operating expenses and taxes are in excess of $2,250,000,000."

A Revolution to Cure a Single Evil.

The *Springfield Republican*, in a comprehensive editorial on the North Haven collision report, discusses present tendencies as follows: "The Interstate Commerce Commission's remedy for 'man failure' is closer government control and regulation of railroads. The most important part of the McChord report is the intimation that the commission will recommend to Congress the enactment of new laws conferring specific authority upon the commission to regulate train operation.

"The question of train safety is already conspicuous as an item in the program of Congress at the coming winter session. How far will Congress go in substituting the Interstate Commerce Commission for the general manager? Spurred by a public sentiment outraged by the manslaughter on the New Haven system, Congress may easily go too far in this direction. The moment the Interstate Commerce Commission undertakes not merely to superwise railroad rates and finances and to investigate railroad wrecks, but also to regulate the actual operation of the roads, a new departure begins. The old line between government supervision of railroads and government operation of railroads will be crossed. The present system is a compromise between private ownership and government ownership. If the time has come for the invasion of the operating field by the government, we may as well begin right away to prepare for complete government ownership.

"The McChord report says very correctly: 'The safety problem on this railroad is primarily a question for itself. If governmental interference and action is called for, it results from the inaction of the corporation.' But new legislation extending the commission's power over the operating department of railroads must apply to all railroads alike. Therefore, the question should be considered from the point of view of the railroads of the country as a whole rather than from the viewpoint of a single company. Do the railroads of the United States require this extension of the authority of the Interstate Commerce Commission? One demoralized railroad can be reorganized without necessarily making an important change in governmental policy. Unless it is desirable for all railroads to be more closely regulated, the operation of the New Haven system should certainly be left to the reorganizing talents of the private management now in control.

"Possibly the approach to government ownership of railroads is actually to be by some such process as is now forecast. Yet government ownership is a policy by itself and in itself involving great questions which deserve careful consideration before the policy is fastened upon the nation. It ought not to be embraced in a spasm of popular indignation over the sins of one railroad corporation. Surely direct government administration is no guarantee against 'man failure.' No one needs to search far for 'man failure' in any department of government service—army, navy or post office. What the government commission would do in dealing with the labor unions on the railroads is a nice question which might appropriately be referred to the politicians."

Trainmen's Arbitration.

The arbitrators considering the demands of the conductors and trainmen in New York City have heard during the past week the testimony of a number of railroad officers, including John Patterson, trainmaster of the Pittsburgh division of the Pennsylvania; C. F. Ray, trainmaster of the Western division of the New York Central, and E. R. Hewitt, assistant trainmaster of the Bessemer & Lake Erie. The chairman of the board, Seth Low, asked questions indicating that he, and Dr. Finley, the other non-railroader on the board, looked upon the testimony, on both sides, as fragmentary and unsatisfactory; they want evidence which will make clear in their minds the basic merits or demerits of the demands of the employees, and the essential features of the position taken by the railroads. Mr. Sheppard, the arbitrator who represents the employees, complained that the railroads were presenting evidence concerning conditions on the richer roads, which conditions do not properly typify the conditions prevailing in the east generally.

In discussing matters of safety, Mr. Patterson said that automatic couplers and air brakes decreased both the injuries to the men and the amount of their work; and a pushing engine on a freight train not only does not increase the danger, as has been claimed, but it decreases the danger from wrecks due to the pulling out of drawbars.

H. W. Chambers, of the New York Central, gave statistics concerning rates of wages and amounts paid for overtime. J. W. Coneys, of the Vandalia, testified concerning conditions in the western states.

A Yellow Government Report.

It scarcely commands public confidence to be informed by the author of this report that because a director happens to be in his opinion a "magician in the art of finance" or a "wizard in the construction, operation and consolidation of great systems," he possesses a "knowledge of the railroad art" in the

sense that he is therefore qualified to be a first class railroad superintendent. Such reasoning would be worthy of a yellow newspaper with an ulterior and sinister purpose of denunciation. This talk, we are frank to say, reaches no further than do the inflammatory yellow newspaper articles to which it is comparable in tone and substance.—*New York Sun.*

Railway Club of Pittsburgh.

The Railway Club of Pittsburgh held its first meeting for the fall season on Friday, September 26. The members were taken from Pittsburgh to Wilmerding, Pa., in a special train over the Pennsylvania Railroad, arriving there at 3:30 in the afternoon. They were met at the station by representatives of the Westinghouse Air Brake Company, and were escorted in groups of 25 through the works of that company. Early in the evening a luncheon was served in the Y. M. C. A. classrooms on the third floor of the Welfare building, the Westinghouse orchestra furnishing music for the occasion. At 7:30 the members gathered in the auditorium of the building, where a very interesting program was presented, including an address of welcome by A. L. Humphrey, vice-president and general manager of the company, and an address by A. G. Mitchell, the president of the club. After a number of musical selections, vocal and instrumental, Mr. Humphrey gave a talk, illustrated by moving pictures and stereopticon views, showing the various forms of welfare work which are being promoted at Wilmerding. An important suggestion which he made for the investigation of this subject by the railway club is commented on editorially in this issue. At 9 o'clock, or a little more than five hours after the party entered the plant, a series of moving pictures was thrown on the screen showing the members of the party as they were divided into groups preparatory to going through the plant. About 500 guests were entertained, including members of the railroad club, their wives and friends.

MEETINGS AND CONVENTIONS.

The following list gives names of secretaries, dates of next or regular meetings, and places of meeting.

Air Brake Association.—F. M. Nellis, 53 State St., Boston, Mass. Next convention, May, 1914.

American Association of Demurrage Officers.—A. G. Thomason, Boston, Mass. Convention, May 19, 1914, St. Louis.

American Association of General Passenger and Ticket Agents.—W. C. Hope, New York. Annual meeting, October 14-15, Philadelphia, Pa.

American Association of Freight Agents.—R. O. Wells, East St. Louis, Ill. Next convention, April 21, Houston, Tex.

American Association of Railroad Superintendents.—E. H. Harman, St. Louis, Mo.; 3d Thursday and Friday in May.

American Electric Railway Association.—H. C. Donecker, 29 W. 39th St., New York. Next convention, October 13-17, Atlantic City, N. J.

American Electric Railway Manufacturers' Assoc.—H. G. McConnaughy, 165 Broadway, New York. Meetings with Am. Elec. Ry. Assoc.

American Railway Association.—W. F. Allen, 75 Church St., New York. Next meeting, November 19, 1913, Chicago.

American Railway Bridge and Building Association.—C. A. Lichty, C. & N. W., Chicago. Convention, October 21-24, 1913, Montreal.

American Railway Engineering Association.—E. H. Fritch, 900 S. Michigan Ave., Chicago. Next convention, March 17-20, Chicago.

American Railway Master Mechanics' Association.—J. W. Taylor, Old Colony building, Chicago.

American Railway Tool Foremen's Association.—A. R. Davis, Central of Georgia, Macon, Ga.

American Society for Testing Materials.—Prof. E. Marburg, University of Pennsylvania, Philadelphia, Pa.

American Society of Civil Engineers.—C. W. Hunt, 220 W. 57th St., New York; 1st and 3d Wed., except June and August, New York.

American Society of Engineering Contractors.—J. R. Wenlinger, 11 Broadway, New York; 2d Tuesday of each month, New York.

American Society of Mechanical Engineers.—Calvin W. Rice, 29 W. 39th St., New York.

American Wood Preservers' Association.—F. J. Angier, B. & O., Baltimore, Md. Next convention, January 20-22, 1914, New Orleans, La.

Association of American Railway Accounting Officers.—C. G. Phillips, 143 Dearborn St., Chicago. Annual meeting, May 28, Atlantic City, N. J.

Association of Railway Claim Agents.—C. W. Egan, B. & O., Baltimore, Md. Next convention, May, 1914, St. Paul, Minn.

Association of Railway Electrical Engineers.—Jos. A. Andreucetti, C. & N. W. Ry., Chicago. Annual convention, October 18-24, Chicago.

Association of Railway Telegraph Superintendents.—P. W. Drew, 112 West Adams St., Chicago. Next convention, May 20-23, New Orleans, La.

Association of Transportation and Car Accounting Officers.—G. P. Conard, 75 Church St., New York. Next meeting, December 9-10, Galveston, Tex.

Association of Water Line Accounting Officers.—W. R. Evans, Chamber of Commerce, Buffalo, N. Y. Annual meeting, October 8, Philadelphia, Pa.

Bridge and Building Supply Men's Association.—H. A. Neally, Joseph Dixon Crucible Co., Jersey City, N. J. Meeting with American Railway Bridge and Building Association.

Canadian Railway Club.—James Powell, Grand Trunk Ry., Montreal, Que.; 2d Tuesday in month, except June, July and Aug., Montreal.

Canadian Society of Civil Engineers.—Clement H. McLeod, 413 Dorchester St., Montreal, Que.; Thursday, Montreal.

Car Foremen's Association of Chicago.—Aaron Kline, 841 North 50th Court, Chicago; 2d Monday in month, Chicago.

Central Railway Club.—H. D. Vought, 95 Liberty St., New York; 2d Thurs. in Jan. and 2d Fri. in March, May, Sept., Nov., Buffalo, N. Y.

Civil Engineers' Society of St. Paul.—L. S. Pomeroy, Old State Capitol building, St. Paul, Minn.; 2d Monday, except June, July, August and September, St. Paul.

Engineers' Society of Pennsylvania.—E. R. Dasher, Box 704, Harrisburg, Pa.; 1st Monday after 2d Saturday, Harrisburg, Pa.

Engineers' Society of Western Pennsylvania.—E. K. Hiles, Oliver building, Pittsburgh; 1st and 3d Tuesday, Pittsburgh, Pa.

Freight Claim Association.—Warren P. Taylor, Richmond, Va. Next convention, May 20-22, Galveston, Tex.

General Superintendents' Association of Chicago.—E. S. Koller, 226 W. Adams St., Chicago; Wed. preceding 3d Thurs., Chicago.

International Railway Congress.—Executive Committee, 11, rue de Louvain, Brussels, Belgium. Convention, 1915, Berlin.

International Railway Fuel Association.—C. G. Hall, 922 McCormick building, Chicago. Annual convention, May 18-22, Chicago.

International Railway General Foremen's Association.—Wm. Hall, 829 West Broadway, Winona, Minn. Next convention, July, Chicago.

International Railroad Master Blacksmiths' Association.—A. L. Woodworth, Lima, Ohio. Next convention, third Tuesday in August.

Maintenance of Way & Master Painters' Association of the United States and Canada.—W. G. Wilson, Lehigh Valley, Easton, Pa. Next convention, November 18-20, Louisville, Ky.

Master Boiler Makers' Association.—Harry D. Vought, 95 Liberty St., New York.

Master Car Builders' Association.—J. W. Taylor, Old Colony building, Chicago.

Master Car and Locomotive Painters' Assoc. of U. S. and Canada.—A. P. Dane, B. & M., Reading, Mass.

National Railway Appliance Assoc.—Bruce V. Crandall, 537 So. Dearborn St., Chicago. Meetings with Am. Ry. Eng. Assoc.

New England Railroad Club.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass.; 2d Tuesday in month, except June, July, Aug. and Sept., Boston.

New York Railroad Club.—H. D. Vought, 95 Liberty St., New York; 3rd Friday in month, except June, July and August, New York.

Northern Railroad Club.—C. L. Kennedy, C., M. & St. P., Duluth, Minn.; 4th Saturday, Duluth.

Peoria Association of Railroad Officers.—M. W. Rotchford, Union Station, Peoria; 2d Thursday.

Railroad Club of Kansas City.—C. Manlove, 1008 Walnut St., Kansas City, Mo.; 3d Friday in month, Kansas City.

Railway Business Association.—Frank W. Noxon, 2 Rector St., New York. Annual dinner, second week in December, 1913, New York.

Railway Club of Pittsburgh.—J. B. Anderson, Penna. R. R., Pittsburgh, Pa.; 4th Friday in month, except June, July and August, Pittsburgh.

Railway Electrical Supply Manufacturers' Assoc.—J. Scribner, 1021 Monadnock Block, Chicago. Meetings with Assoc. Ry. Elec. Engrs.

Railway Fire Protection Association.—C. B. Edwards, Mobile & Ohio, Mobile, Ala. Next meeting, October 7, Chicago.

Railway Gardening Association.—J. S. Butterfield, Lee's Summit, Mo.

Railway Development Association.—W. Nicholson, Kansas City Southern, Kansas City, Mo.

Railway Signal Association.—C. C. Rosenberg, Bethlehem, Pa. Convention, October 14, Nashville, Tenn.

Railway Storekeepers' Association.—J. P. Murphy, Box C, Collinwood, Ohio.

Railway Supply Manufacturers' Assoc.—J. D. Conway, 2135 Oliver bldg., Pittsburgh, Pa. Meetings with M. M. and M. C. B. Assocs.

Railway Tel. & Tel. Appliance Assoc.—W. E. Harkness, 284 Pearl St., New York. Meetings with Assoc. of Ry. Teleg. Sups.

Richmond Railroad Club.—F. O. Robinson, Richmond, Va.; 2d Monday except June, July and August.

Roadmasters' and Maintenance of Way Association.—L. C. Ryan, C. & N. W., Sterling, Ill. Next convention, September 8-11, 1914, Chicago.

St. Louis Railway Club.—B. W. Frauenthal, Union Station, St. Louis, Mo.; 2d Friday in month, except June, July and Aug., St. Louis.

Signal Appliance Association.—F. W. Edmonds, 3868 Park Ave., New York. Meeting with annual convention Railway Signal Association.

Society of Railway Financial Officers.—C. Nyquist, La Salle St. Station, Chicago.

Southern Association of Car Service Officers.—E. W. Sandwich, A. & W. P. Ry., Montgomery, Ala. Annual meeting, October 16, 1913, Atlanta, Ga.

Southern & Southwestern Railway Club.—A. J. Merrill, Grant bldg., Atlanta, Ga.; 3d Thurs., Jan., March, May, July, Sept., Nov., Atlanta.

Toledo Transportation Club.—J. G. Macomber, Woolson Spice Co., Toledo, Ohio; 1st Saturday, Toledo.

Track Supply Association.—W. C. Kidd, Ramapo Iron Works, Hillsburn, N. Y. Meeting with Roadmasters' and Maintenance of Way Association.

Traffic Club of Chicago.—W. H. Wharton, La Salle Hotel, Chicago.

Traffic Club of New York.—C. A. Swope, 290 Broadway, New York; last Tuesday in month, except June, July and August, New York.

Traffic Club of Pittsburgh.—D. L. Wells, Erie, Pittsburgh, Pa.; meetings monthly, Pittsburgh.

Traffic Club of St. Louis.—A. F. Versen, Mercantile Library building, St. Louis, Mo. Annual meeting in November. Noonday meetings October to May.

Train Despatchers' Association of America.—J. F. Mackie, 7122 Stewart Ave., Chicago. Next convention, June 16, Jacksonville, Fla.

Transportation Club of Buffalo.—J. M. Sells, Buffalo; first Saturday after first Wednesday.

Transportation Club of Detroit.—W. R. Hurley, L. S. & M. S., Detroit, Mich.; meetings monthly.

Traveling Engineers' Association.—W. O. Thompson, N. Y. C. & H. R., East Buffalo, N. Y. Next meeting, Chicago.

Utah Society of Engineers.—Fred D. Ulmer, Oregon Short Line, Salt Lake City, Utah; 3rd Friday of each month, except July and August.

Western Canada Railway Club.—W. H. Rosevear, P. O. Box 1707, Winnipeg, Man.; 2d Monday, except June, July and August, Winnipeg.

Western Railway Club.—J. W. Taylor, Old Colony building, Chicago; 3d Tuesday of each month, except June, July and August.

Western Society of Engineers.—J. H. Warder, 1735 Monadnock Block, Chicago; 1st Monday in month, except July and August, Chicago.

Traffic News.

According to a report compiled by the Oregon Railroad Commission out of 26,963 trips of passenger trains in the state from January to June inclusive this year, 21,356 were on time, or 79.2 per cent. The average delay of the trains late was 11.6 minutes.

The Pullman Company announces that, beginning November 1, the rate for a lower berth in a sleeping car between Los Angeles and San Diego will be reduced from $2 to $1.50. This change was made on the informal request of the California State Railroad Commission.

At a recent meeting of the Southwestern Tariff Committee it was decided to make effective on October 1 the plan announced earlier in the year by which tariffs issued by the committee will be furnished to shippers at a subscription price for the year based on the extra cost of paper, presswork and mailing above the cost of the supply required for the railways' own use. The prices were stated in a special circular issued June 16.

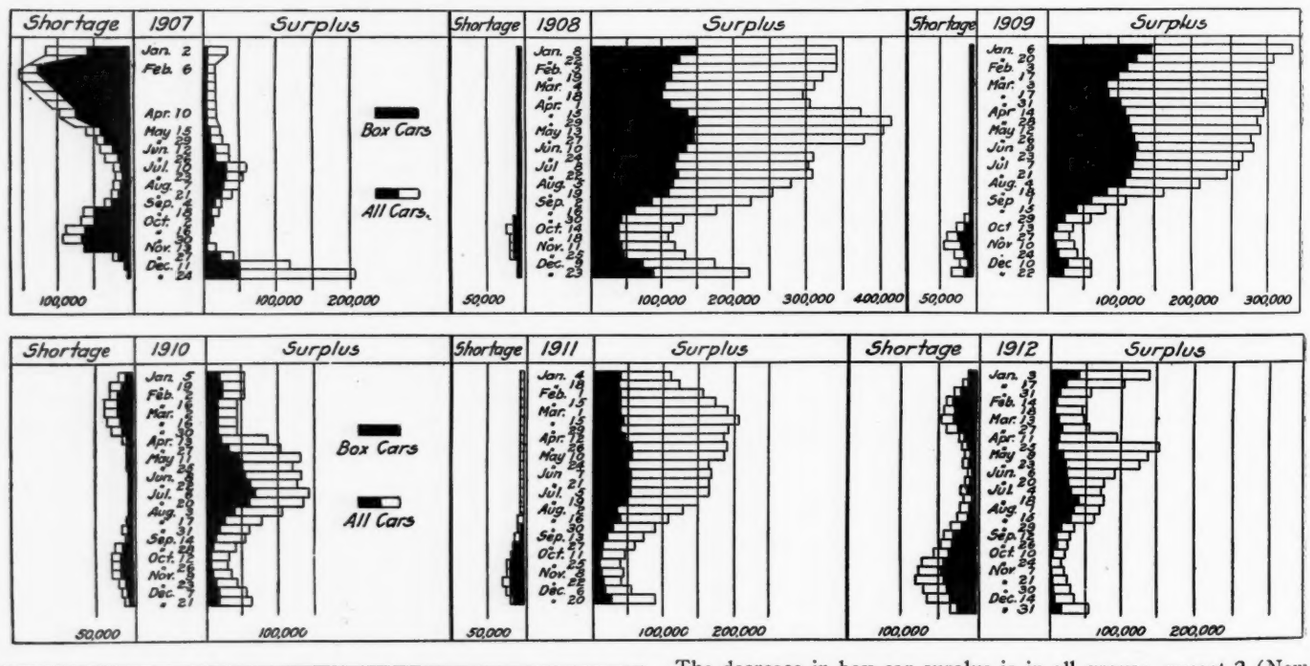
Car Surpluses and Shortages.

Arthur Hale, chairman of the committee on relations between railroads of the American Railway Association, in presenting statistical bulletin No. 151-A, giving a summary of car surpluses and shortages by groups from June 6, 1912, to September 15, 1913, says: The total surplus on September 15, 1913, was 61,753 cars; on September 1, 1913, 72,576 cars; and on September 12, 1912, 27,380 cars. Compared with the preceding period; there is a decrease in the total surplus of 11,823 cars, made up as follows: A decrease of 10,594 in box, 1,413 in flat, and an increase of 25 in coal and 159 in miscellaneous car surplus.

CAR SURPLUSES AND SHORTAGES.

Date	No. of roads.	Surpluses: Box.	Flat.	Coal, gondola and hopper.	Other kinds.	Total.	Shortages: Box.	Flat.	Coal, gondola and hopper.	Other kinds.	Total.
Group *1.—September 15, 1913	7	168	140	32	209	549	83	115	17	3	218
" 2.— " 15, 1913	31	366	53	1,499	530	2,448	740	0	812	0	1,552
" 3.— " 15, 1913	30	332	283	327	661	1,603	2,134	25	1,801	344	4,304
" 4.— " 15, 1913	14	2,433	380	633	506	3,952	2,712	363	3,186	560	6,821
" 5.— " 15, 1913	26	0	0	929	505	1,434	1,953	616	749	36	3,354
" 6.— " 15, 1913	34	6,292	303	1,162	3,489	11,246	1,523	132	1,087	104	2,846
" 7.— " 15, 1913	4	56	18	544	309	927	163	0	0	32	195
" 8.— " 15, 1913	20	4,808	198	1,661	2,552	9,219	289	6	51	1	347
" 9.— " 15, 1913	15	1,985	238	431	604	3,258	106	0	0	4	110
" 10.— " 15, 1913	21	3,738	834	1,420	7,098	13,090	439	27	28	178	672
" 11.— " 15, 1913	6	12,220	288	76	1,443	14,027	930	139	0	106	1,175
Total	208	32,398	2,735	8,714	17,906	61,753	11,072	1,423	7,731	1,368	21,594

*Group 1 is composed of New England lines; Group 2—New York, New Jersey, Delaware, Maryland and Eastern Pennsylvania lines; Group 3—Ohio, Indiana, Michigan and Western Pennsylvania lines; Group 4—West Virginia, Virginia, North and South Carolina lines; Group 5—Kentucky, Tennessee, Mississippi, Alabama, Georgia and Florida lines; Group 6—Iowa, Illinois, Wisconsin and Minnesota lines; Group 7—Montana, Wyoming, Nebraska, North Dakota and South Dakota lines; Group 8—Kansas, Colorado, Missouri, Arkansas and Oklahoma lines; Group 9—Texas, Louisiana and New Mexico lines; Group 10—Washington, Oregon, Idaho, California, Nevada and Arizona lines; Group 11—Canadian lines.



Car Surpluses and Shortages, 1907 to 1913.

The decrease in box car surplus is in all groups, except 2 (New York, New Jersey, Delaware, Maryland and eastern Pennsylvania), 7 (Montana, Wyoming, Nebraska and the Dakotas) and 9 (Texas, Louisiana and New Mexico). The decrease in flat car surplus is in all groups, except 3 (Ohio, Indiana, Michigan and western Pennsylvania), 7 (as above) and 8 (Kansas, Colorado, Oklahoma, Missouri and Arkansas). The increase in coal car surplus is in groups 1 (New England Lines) 3 (as above), 4 (the Virginias and Carolinas), 5 (Kentucky, Tennessee, Mississippi, Alabama, Georgia and Florida), 6 (Iowa, Illinois, Wisconsin and Minnesota) and 7 (as above). The increase in miscellaneous car surplus is in groups 1, 4, 7, 8, 9 (as above), 10 (Washington, Oregon, Idaho, California, Nevada and Arizona) and 11 (Canadian Lines. Compared with the preceding period; there is an increase in the total shortage of

6,324 cars, of which 3,445 is in box, 2,522 in coal, 700 in miscellaneous, and a decrease of 343 in flat car shortage. The increase in box car shortage is in all groups, except 1, 6, 10 and 11 (as above). The increase in coal car shortage is in groups 2, 3, 4 and 6 (as above). The increase in miscellaneous car shortage is in all groups, except 1, 8 and 9 (as above). The decrease in flat car shortage is in groups 2, 3, 4, 6, 8, 10 and 11.

Compared with the same date of 1912; there is an increase in the total surplus of 34,373 cars, of which 24,492 is in box, 1,450 in flat, 3,404 in coal and 5,027 in miscellaneous car surplus. There is a decrease in the total shortage of 14,406 cars, of which 11,765 is in box, 1,759 in flat, 600 in coal and 282 in miscellaneous car shortage.

The accompanying table gives car surplus and shortage figures by groups for the last period covered in the report and the diagram shows total bi-weekly surpluses and shortages from 1907 to 1913.

Pasquotank Objects.

The Governor and other officers of the State of North Carolina are negotiating with the railroads with a view to securing changes in freight rates, some of which changes may not be extreme reductions. The Governor may possibly compromise some points. This possibility produces a chill in some quarters. From Elizabeth City it is reported that the Pasquotank County Just Freight Rate Association, at a largely attended meeting, has enthusiastically declared its opposition to the proposition by the railroads to effect a compromise. It was ordered that the secretary of the association telegraph President Tate of the State Freight Rate Association and Governor Craig, of this action. A committee was appointed to solicit subscriptions from the merchants to defray the expenses of delegates to be sent to Raleigh.

Extensive Rate Reduction in North Carolina.

The legislature of North Carolina is now sitting in special session, at Raleigh, to consider proposals made by the railroads for readjustment of freight rates, both intrastate and interstate, the business men of important cities having demanded reductions from eastern, northern and western states. The propositions of the railroads are the result of extended discussions with the governor and other state officers; and the governor has recommended that the tariffs now proposed by the roads be accepted. These tariffs make changes which will reduce the railroads' income at the rate of $2,000,000 a year.

The Two-Dollar Controversy at St. Louis.

Shippers and receivers of carload freight handled by the Manufacturers' Railway Company have been notified that hereafter they must make a $2 payment in addition to the regular St. Louis rates. This announcement was made by George F. Moore, president of the road.

Mr. Moore says that this action is rendered necessary by the action of the proprietary and tenant lines of the Terminal Association in canceling the participation in rates heretofore enjoyed by the Manufacturers' Railway.

Should the Interstate Commerce Commission grant a rehearing and reverse the latest ruling, the $2 payments made in the meantime will be refunded, unless the commission forbids, says President Moore.

"Freight in less than carload lots cannot be handled by the Manufacturers for any other than these lines: Rock Island, Chicago & Eastern Illinois, Chicago & Alton, Frisco, M. K. & T., and Toledo, St. Louis & Western.

"These companies having joint facility contracts," says the announcement, "the Manufacturers' Railway Company still will receive for them traffic at the freight station at Second and Rutger streets."

The circular further states that the Manufacturers' through its counsel, and the shippers, represented by counsel, will ask a rehearing of the case, which was "partially decided" by the commission.

Soon after the decision of the commission in August, President Moore addressed a letter to all trunk lines entering St. Louis, inviting them to take over the operation of the Manufacturers' line on a cost basis for one year. Some of the railroad executives viewed the plan with favor, but charges were made that it was a plan to give the Terminal road control of the rival property, and Mr. Moore soon withdrew the offer. He has stated repeatedly that his line cannot be operated on a charge of only $2 a car.

The Busch interests have bought the St. Louis & O'Fallon road and have acquired a trackage right over the Alton & Southern, thus obtaining a line, by means of a transfer boat, to the St. Louis & O'Fallon coal mines. By taking over this traffic, which the Terminal has controlled, the Busch people expect to prove independence of the Terminal. The St. Louis & O'Fallon, which is nine miles long, has been connected with the outer belt of the Terminal. It parallels the Louisville & Nashville and intersects an uncompleted line of the Alton & Southern.

STATE COMMISSIONS.

Henry B. Schreiber, a member of the Louisiana Railroad Commission, died at New Orleans, La., on September 22.

C. S. Cunningham, who was formerly and until December, 1912, an assistant superintendent on the Grand Trunk, has been appointed a member of the Michigan Railroad Commission, to succeed James Scully, deceased.

The Iowa Railroad Commission will hold an adjourned hearing on October 14, at Des Moines, on the subject of demurrage in Iowa. Among the subjects to be considered is a proposed increase of the demurrage rate of from $1 to $3.

The Nebraska Railroad Commission has issued an order declaring the present rates on apples in the state unreasonable and prescribing a maximum distance table of rates up to 600 miles, ranging from 5 cents to 30.75 cents per 100 lbs., graded for each increase of five miles in the length of haul.

Henderson Martin, chairman of the Kansas Public Utilities Commission, has sent notices to the utilities commissions of Iowa, Minnesota, Nebraska, Oklahoma, Missouri, North Dakota and South Dakota, asking them to join in a movement intended to prevent a proposed increase in railroad freight rates on manufactured products shipped from Eastern states to the middle west. He said the railroads recently announced an increase of 5 per cent. in the rates on all business originating between New York and Chicago, and that 75 per cent. of the incoming freight to the eight states, which he declared should oppose the proposed increase, originates in the territory east of Chicago. Chairman Martin suggested that the various state commissions should meet and outline a plan of action before appearing at a hearing before the Interstate Commerce Commission.

COURT NEWS.

The attorney-general of Wisconsin has recently asked the Supreme Court of the state for permission to file an information in quo warranto to determine whether the charter of the Northern Pacific should not be forfeited on the ground that the company did not pay the fee required by the Wisconsin laws for increasing its capital stock. He says the amount due is $250,000. The question is to be argued this month.

PROPOSED ARGENTINE PENSION FUND.—The bill recently passed by the Argentine chamber of deputies, and modified by the Legislative committee, for establishing a national pension fund, may go through the senate in the form in which it now stands. In the main the bill includes in its benefits all the employees of the state lines and those of private companies under national jurisdiction, and service will be computed in calculating the period, though they may at any time have been subjected to provincial jurisdiction. Article 5 provides that the fund shall be formed by contributions from the state, from the private railways and from the employees, and the money collected from: (1) A tax on railway fares created by the law which consists of ten cents on tickets above one dollar, and four cents on the price of each season ticket. (2) Sums received for excess charges. (3) Deduction of 5 per cent. from the salaries and wages of employees. (4) Retention by twenty-four monthly instalments of one-half of the first monthly salary, and the whole for one month only of every increase in salary.

REVENUES AND EXPENSES OF RAILWAYS.

MONTH OF JULY, 1913.

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses						Net operating revenue (or deficit).	Outside operations, net.	Taxes.	Operating income (or loss).	Increase (or decr.) comp. with last year.
					Maintenance										
		Freight.	Passenger.	Total, inc. misc.	Way and structures.	Of equipment.	Traffic.	Transportation.	General.	Total.					
Alabama & Vicksburg	309	$276,295	$120,187	$432,289	$54,184	$111,025	$13,095	$149,011	$8,908	$336,223	$96,066	—$376	$15,300	$80,390	—$2,723
Alabama Great Southern	143	90,255	44,814	146,297	24,190	32,025	3,851	54,509	5,818	120,393	25,904	—1,467	7,450	16,987	—19,632
Atlantic City	167	73,499	285,869	372,813	23,853	11,614	3,757	158,831	3,450	201,505	171,308	—5,553	9,000	156,755	23,973
Bangor & Aroostook	631	141,492	58,009	214,474	42,388	43,195	2,657	78,870	10,617	177,727	36,747	128	9,757	27,118	—22,162
Canadian Pacific Lines in Maine	233	39,620	26,284	72,957	45,793	15,357	6,766	33,860	5,247	107,023	—34,066	.....	11,000	—45,066	—13,741
Chicago & Erie	270	336,942	66,938	442,941	88,857	104,669	23,902	220,927	12,379	450,734	—7,793	12	12,895	—20,676	—54,119
Chicago & North Western	7,976	4,670,398	2,004,596	7,345,766	1,337,481	1,053,055	129,214	2,682,740	141,443	5,343,933	2,001,833	—4,597	320,000	1,677,236	—108,299
Chicago, Rock Island & Pacific	7,525	3,488,658	1,717,420	5,559,682	941,005	905,105	160,307	2,226,534	155,062	4,388,013	1,171,669	—19,576	270,753	881,340	—368,261
Cincinnati, New Orleans & Texas Pacific	337	609,346	163,851	820,468	91,355	192,178	24,620	246,517	18,826	573,496	246,972	—146	29,000	217,826	—12,529
Colorado Midland	338	121,810	39,959	171,210	36,924	37,262	8,882	67,549	5,554	156,171	15,039	—148	8,000	6,891	—13,668
Cumberland Valley	162	212,289	64,147	287,202	63,961	24,916	4,840	88,198	7,670	189,585	97,617	239	5,702	92,154	13,975
Denver & Salt Lake	215	61,377	61,759	129,598	27,017	18,333	4,439	32,163	4,008	85,960	43,638	.....	4,000	39,638	5,071
Duluth, Winnipeg & Pacific	166	134,179	26,845	163,216	39,227	17,899	3,079	48,662	5,552	114,419	48,797	.....	8,172	40,625	24,811
Erie	1,988	3,386,386	1,007,225	4,762,590	620,149	824,510	105,918	1,484,496	124,243	3,159,316	1,603,274	391	138,546	1,465,119	—79,705
Florida East Coast	642	141,193	107,306	287,153	82,093	63,504	5,024	132,982	11,248	294,851	—7,698	—1,407	20,000	—29,105	—14,166
Gulf & Ship Island	308	126,788	43,376	181,493	20,677	25,912	2,249	45,394	7,878	102,110	79,383	.....	7,156	72,227	21,139
Illinois Central	4,763	3,443,049	1,191,204	5,318,442	869,549	1,191,055	99,013	1,985,742	136,637	4,281,996	1,036,446	—3,966	264,000	768,480	153,715
Kansas City Southern	827	580,474	154,650	813,883	71,491	115,219	27,456	280,917	35,077	530,160	283,723	.....	40,013	243,710	3,393
Lehigh & Hudson River	97	134,327	4,822	149,581	38,857	20,073	1,451	55,861	3,599	119,841	29,740	.....	4,000	25,740	—17,893
Lehigh & New England	269	131,974	839	137,246	22,154	21,502	1,457	35,932	3,195	84,240	53,006	.....	3,179	49,827	—10,126
Lehigh Valley	1,438	2,806,549	519,096	3,447,701	413,137	582,355	93,321	1,159,394	67,304	2,315,511	1,132,190	—23,583	121,000	987,607	—266,263
Louisiana Ry. & Navigation	351	115,898	27,440	152,496	32,820	22,687	6,504	61,819	5,641	129,471	23,025	.....	5,500	17,525	—31,552
Missouri & North Arkansas	365	64,812	39,616	110,400	27,184	17,382	3,031	40,350	5,460	93,407	16,993	.....	5,500	11,493	20,802
Monongahela	67	129,131	3,173	134,563	21,168	6,081	302	25,106	2,180	54,837	79,726	.....	2,350	77,376	21,494
Morgan's Louisiana Railroad & S. S. Co.	404	208,575	101,558	332,433	43,905	84,686	12,879	143,276	14,071	298,817	33,616	—1,257	18,250	14,109	—14,216
New Orleans & North Eastern	196	273,137	57,873	355,339	37,408	74,358	9,634	132,040	12,501	265,941	89,398	789	15,800	74,387	31,196
New York Central & Hudson River	3,750	5,579,457	3,498,395	10,104,811	1,616,209	1,920,245	210,643	3,558,766	254,741	7,560,604	2,544,207	—35,005	535,284	1,973,918	—136,689
New York, Ontario & Western	566	600,324	330,125	987,904	138,067	134,700	12,367	309,614	20,231	614,979	372,925	2,890	19,000	356,815	—61,329
New York, Susquehanna & Western	154	144,594	53,912	224,379	32,613	30,851	1,690	95,958	6,763	167,875	56,504	4,067	17,649	42,922	—109
Norfolk Southern	569	148,076	78,247	255,972	29,802	33,581	4,528	86,122	12,564	166,597	89,375	.....	9,210	80,165	376
Oregon-Washington R. R. & Nav. Co.	1,914	927,974	497,533	1,525,539	235,178	170,800	58,341	496,477	55,135	1,015,931	509,608	—6,044	112,968	390,596	—128,459
Philadelphia & Reading	1,020	2,978,517	681,287	3,856,889	445,801	631,683	49,075	1,289,075	69,749	2,485,383	1,371,506	26,060	103,050	1,294,516	—99,131
Port Reading	21	89,613	.....	92,684	14,174	225	33	26,695	279	41,406	51,278	—2,725	8,000	40,553	—18,480
St. Louis, San Francisco & Texas	244	101,518	35,273	143,364	19,991	14,235	2,624	45,174	5,887	87,911	55,453	.....	1,225	54,228	38,333
St. Louis Southwestern of Texas	811	256,950	113,136	399,928	111,141	93,567	12,236	158,593	21,110	396,647	3,281	—386	17,800	—14,905	—135,591
San Antonio & Aransas Pass	724	228,745	138,205	388,623	83,020	69,774	5,623	160,606	11,166	330,189	58,434	.....	12,000	46,434	—23,887
San Pedro, Los Angeles & Salt Lake	1,133	518,261	285,549	865,526	119,228	136,336	32,682	289,193	20,329	597,768	267,758	—1,897	43,900	221,961	—39,027
Seaboard	3,082	1,180,745	421,916	1,812,213	223,133	256,464	66,067	702,011	53,703	1,301,378	510,835	—1,872	82,000	426,963	65,263
Southern Pacific Co.	6,381	4,478,638	2,941,255	8,029,287	911,519	1,123,852	162,842	2,191,254	240,945	4,630,412	3,398,875	136,476	401,348	3,134,003	—499,016
Spokane International	163	69,721	24,553	97,833	18,705	6,421	1,971	26,961	3,622	57,680	40,153	.....	3,021	37,132	—2,730
Spokane, Portland & Seattle	556	245,532	185,841	467,475	66,241	37,792	8,704	107,584	12,845	233,166	234,309	1,911	53,400	182,820	—15,682
Trinity & Brazos Valley	463	102,876	54,380	164,176	49,781	31,311	10,643	91,881	11,747	195,363	—31,187	.....	4,000	—35,187	—14,803
Union Railroad of Pennsylvania	31	.....	.....	497,360	43,879	92,816	109	167,937	2,557	307,298	190,062	4,429	10,000	184,491	—23,182
Vicksburg, Shreveport & Pacific	171	82,156	52,146	144,852	22,985	29,119	3,728	53,326	4,934	114,092	30,760	—140	7,800	22,820	3,075
Virginian	503	420,724	36,457	471,176	60,993	86,619	5,491	111,544	9,241	273,888	197,288	6,323	21,060	182,551	49,969
Western Pacific	934	441,121	149,014	605,172	110,768	55,389	27,074	191,402	39,878	424,511	180,661	778	29,667	151,772	22,827
Wheeling & Lake Erie	459	675,127	63,870	775,447	187,760	148,402	8,830	238,302	16,026	599,320	176,127	—260	32,339	143,528	—83,551
Yazoo & Mississippi Valley	1,372	548,613	202,541	807,249	172,166	156,149	14,289	355,340	26,647	724,591	82,658	—997	43,000	38,661	47,757

Railway Officers.

Executive, Financial and Legal Officers.

W. L. Seddon, assistant to president of the Seaboard Air Line, at Norfolk, Va., has been elected also vice-president of the Macon, Dublin & Savannah.

T. H. Burgess, assistant commerce counsel of the Erie at New York, has been appointed assistant general solicitor of the Erie, the New York, Susquehanna & Western, the New Jersey & New York, and the Chicago & Erie, with headquarters at New York.

J. W. McCullough, auditor of the New Orleans, Texas & Mexico, Beaumont, Sour Lake & Western and Orange & Northwestern, has been appointed treasurer also of the two former roads, with headquarters at New Orleans, La., succeeding J. H. Lauderdale, transferred.

William Curren Everett, who has been appointed auditor of the Virginian Railway, with headquarters at Norfolk, Va., as has been announced in these columns, was born on September 3, 1879, at Fort Valley, Ga., and was educated in the high schools. He began railway work in 1896, with the Georgia & Alabama, and from August 1, 1900, to December, 1902, was in the service of its successor, the Seaboard Air Line, at Portsmouth, Va. He was then appointed store accountant of the Cincinnati Traction Company, at Cincinnati, Ohio, and in August, 1903, returned to the Seaboard Air Line, at Portsmouth, leaving that road in January, 1906, to go to the Virginian Railway, and September 18, was promoted to auditor as above noted.

Operating Officers.

C. H. Calkins has been appointed chief trainmaster of the Buffalo division of the New York Central & Hudson River, with office at Buffalo, N. Y.

E. P. Welshonce has been appointed trainmaster of the west end, Cumberland division of the Baltimore & Ohio, with office at Keyser, W. Va., succeeding M. H. Broughton, promoted.

N. A. Waldron, storekeeper of the St. Louis Southwestern, with headquarters at Pine Bluff, Ark., has been appointed superintendent of the Missouri, Kansas & Texas, with office at Parsons, Kan.

C. Woodard has been appointed assistant superintendent of the Texas & New Orleans and the Galveston, Harrisburg & San Antonio, Galveston division, with office at Houston, Tex., succeeding F. J. Taylor, assigned to other duties.

Thomas K. Scott has resigned as general manager of the Georgia Railroad, on account of ill health, effective October 1, but will continue his connection with the road until July 1, 1914, and C. A. Wickersham, president and general manager of the Atlanta & West Point and the Western Railway of Alabama, at Atlanta, Ga., has been appointed, also general manager of the Georgia Railroad, with headquarters at Augusta.

Charles H. Motsett, whose appointment as superintendent of the new New York division of the New York, New Haven & Hartford, with headquarters at Harlem River, N. Y., has been announced in these columns, was born on December 4, 1875, at Peoria, Ill., and was educated in the public schools of his native town. He began railway work as a clerk with the Great Eastern Fast Freight Line at Peoria in March, 1891, and one year later went to the Chicago, Rock Island & Pacific, serving as yard clerk and switchman alternately, until September, 1902, when he was transferred to Rock Island, Ill., as assistant night yardmaster, and on April 1, 1903, was promoted to assistant general yardmaster in the city terminal. The following October he was transferred to Council Bluffs, Iowa, and in October, 1904, was again transferred to Des Moines, in the same capacity. He was appointed trainmaster in October, 1905, of the Minneapolis & St. Louis, at Des Moines, and in February, 1908, went to the New York, New Haven & Hartford as freight trainmaster on the New York division, and in December, 1909, when that division was abolished, he was appointed trainmaster of terminals at Harlem River, which position he held at the time of his appointment as superintendent of the re-established New York division of the same road, as above noted.

Traffic Officers.

H. R. Wilson has been appointed commercial agent of the New Orleans Great Northern, at Jackson, Miss., in place of J. J. Stevens, resigned.

J. A. Fitzgerald has been appointed soliciting freight agent of the Atchison, Topeka & Santa Fe, at Houston, Tex., in place of W. R. Pillsbury, resigned.

W. R. Pillsbury has been appointed traveling freight and passenger agent of the Chicago, Burlington & Quincy, with headquarters at Dallas, Tex., succeeding Charles Sorg, Jr., resigned.

Charles Sorg, Jr., traveling freight and passenger agent of the Chicago, Burlington & Quincy, at Dallas, Tex., has been appointed commercial agent of the Ft. Worth & Denver City, at Ft. Worth, Tex.

P. W. Booth has been appointed traveling freight agent of the International & Great Northern, with headquarters at San Antonio, Tex., succeeding E. H. McFadden, who has been transferred to Houston, Tex.

G. S. Hinkins, freight soliciting agent of the Southern at Huntsville, Ala., has been appointed commercial agent, with office at Savannah, Ga., succeeding C. E. Gay, Jr., resigned to accept service with another company.

J. E. Shipley has been appointed assistant general passenger agent of the Tennessee Central, with headquarters at Nashville, Tenn., and J. F. Jenkins having resigned as city passenger agent at Nashville, to engage in other business, his former position has been abolished.

Engineering and Rolling Stock Officers.

W. W. Morrison has been appointed engineer maintenance of way and structures of the Pittsburg & Shawmut, with headquarters at Kittanning, Pa.

George C. Cleveland, chief engineer of the Lake Shore & Michigan Southern, at Cleveland, Ohio, has been appointed also chief engineer of the Cleveland Short Line, succeeding Samuel Rockwell.

R. D. Garner has been appointed engineer of construction of the Southern New England Railroad Corporation, and the Southern New England Railway Company, with office at Providence, R. I., effective October 1.

S. H. Osborne has been appointed division engineer of the Oregon Short Line, covering the territory Pocatello to Granger, including branches, with headquarters at Pocatello, Idaho. G. H. Cumberland, assistant engineer at Salt Lake City, Utah, has been appointed division engineer, with headquarters at Pocatello, with jurisdiction over the territory, Pocatello yard and Pocatello to Huntington, including branches. Mr. Osborne and Mr. Cumberland succeed A. Q. Campbell, assistant superintendent, resigned.

Harry Rose Warnock, whose appointment as superintendent of motive power of the Western Maryland, with headquarters at Hagerstown, Md., has been announced in these columns, was born on July 16, 1870, at Newcastle, Pa., and was educated in the public schools. He began railway work in June, 1889, with the Pennsylvania Lines West of Pittsburgh as a freight brakeman, and later in the same year went to the Pittsburgh & Lake Erie as a brakeman. He was then locomotive fireman and later engineman on the same road. From May, 1901, to May, 1904, he was consecutively engine despatcher, roundhouse and general foreman on the Monongahela division of the same road, and then to October, 1905, was master mechanic of the West Side Belt, at Pittsburgh, Pa. In October, 1905, he became general foreman of the Monongahela Railroad and was subsequently made master mechanic of that road, which position he held at the time of his recent appointment as superintendent of motive power of the Western Maryland, as above noted.

Purchasing Officers.

J. M. Killian has been appointed storekeeper of the St. Louis Southwestern lines, and will have charge of all miscellaneous supplies and material other than ties, timber, piling, lumber and fuel, with headquarters for the St. Louis Southwestern at Pine Bluff, Ark., and for the St. Louis Southwestern of Texas at Tyler, Tex. He succeeds N. A. Waldron, resigned.

Special Officers.

Donald C. Welty, assistant agricultural agent of the Texas & Pacific at New Orleans, La., has been appointed agricultural commissioner of the St. Louis, Iron Mountain & Southern, with headquarters at St. Louis, Mo., succeeding L. A. Markham, resigned on account of ill health; effective October 1.

OBITUARY.

James Smith, formerly, from July, 1884, to July, 1887, traffic manager of the Wabash Western (now the Wabash), and later successively chairman of the Transcontinental Association and the Trans-Missouri Association until 1893, died recently at his home in Ft. Wayne, Ind., aged 77 years.

William F. Ray, general superintendent of the Boston & Maine, died suddenly on September 26, at Boston, Mass. He was born in 1857 at South Vernon, Vt., and was educated at Fort Wayne and at the University of Notre Dame, South Bend, Ind. He began railway work in 1874 as locomotive fireman on the Connecticut River Railroad, now a part of the Boston & Maine, and later held various positions in the freight train service, including that of brakeman and conductor, and then entered the passenger train service as conductor. He was subsequently trainmaster and assistant superintendent. In 1903 he was appointed superintendent of the Concord division of the Boston & Maine, and in October, 1911, was transferred as superintendent to the Portland division. He was appointed general superintendent in October, 1912.

Samuel B. Haupt, president and general manager of the Susquehanna, Bloomsburg & Berwick, died at his home at Milton, Pa., on September 28, at the age of 64. His death was due to injuries he sustained in a collision on his own road at Berwick four weeks ago. He was born in Union county, Pennsylvania, and began railway work on August 10, 1868, as an apprentice in the Pennsylvania Railroad shops at Altoona, and later became machinist. He subsequently was draftsman, chief draftsman and assistant master mechanic of the same shops. He was then superintendent of the Roanoke Machine Works, and from May, 1885, to May, 1891, was also superintendent of motive power of the Norfolk & Western. He later became general manager of the Central Pennsylvania & Western, and since January 1, 1912, had been president and general manager of its successor, the Susquehanna, Bloomsburg & Berwick.

John F. Ensign, chief inspector of locomotive boilers, in the Division of Locomotive Boiler Inspection, of the Interstate Commerce Commission, died on September 24, after a long illness, at his home in Washington, D. C. He was born on March 23, 1862, at Marathon, N. Y. As a young man he went to Colorado and began railway work with the Chicago, Burlington & Quincy as a blacksmith. He later was made machinist, and subsequently became fireman and engineman. Nine years ago he was appointed an inspector in the Division of Safety Appliances of the Interstate Commerce Commission; and on March 2, 1911, was appointed chief inspector of locomotive boilers by President Taft, with headquarters at Washington. He was a member of the Brotherhood of Locomotive Engineers and a member of the Washington Society of Engineers. Mr. Ensign had spoken on safety appliances and the inspection of locomotive boilers before different railway clubs and other organizations.

J. F. Ensign.

Equipment and Supplies.

LOCOMOTIVE BUILDING.

The Pennsylvania Railroad has ordered 50 locomotives from the Baldwin Locomotive Works.

The Green Bay & Western has ordered 1 mogul locomotive from the American Locomotive Company. The dimensions of the cylinders will be 19 in. x 26 in.; the diameter of the driving wheels will be 56 in., and the total weight in working order will be 138,000 lbs.

The Spokane, Portland & Seattle has ordered 2 six-wheel switching locomotives from the American Locomotive Company. These locomotives will be equipped with superheaters, will have 20 in. x 26 in. cylinders, 51 in. driving wheels, and in working order will weigh 154,000 lbs.

The San Pedro, Los Angeles & Salt Lake has ordered 8 oil-burning mikado locomotives from the American Locomotive Company. These locomotives will be equipped with superheaters, will have 26 in. x 28 in. cylinders, 63 in. driving wheels, and in working order will weigh 285,000 lbs.

CAR BUILDING.

The Chicago, Milwaukee & St. Paul is in the market for 10 sixty-foot mail cars.

The Long Island has ordered 40 motor passenger cars, 20 express cars, 15 motor combination passenger and baggage cars, 12 coaches and 3 combination passenger and baggage cars from the American Car & Foundry Company. These cars will all be of steel construction throughout.

The Great Northern, mentioned in the *Railway Age Gazette* of September 19 as having ordered 125 passenger cars from the Pullman Company and the Barney & Smith Car Company, has not placed this order, but is figuring on 50 coaches, 25 baggage cars, 20 sleeping cars, 25 postal cars and 10 observation cars.

The Chicago & North Western, mentioned in the *Railway Age Gazette* of September 26, as being in the market for 1,000 gondola cars, is now making inquiries for from 2,000 to 2,500 gondola cars, 36 coaches, 27 smoking cars, 30 baggage cars and 8 mail cars; all these cars to be of all steel construction.

IRON AND STEEL.

General Conditions in Steel.—Conditions in the steel market continue to be very much the same. Orders have been light during the past week, but the railroads are figuring on their rail requirements for 1914, and a number of heavy orders are expected in the near future. It is believed that if these orders do not come up to expectations, a number of mills will have to reduce their operations. Reports from abroad regarding the steel industry are discouraging. In Great Britain five blast furnaces have closed and prices for steel in Germany continue to sag. Based on foreign prices and prices in this country, many classes of steel can be laid down by Europe at Atlantic seaboard ports under the new tariff at a profit. The margin is wide enough to warrant the statement that foreign steel can be sold profitably pretty far into the interior in competition with domestic mills. These facts have been appreciated by consumers, with the result that they are holding up orders as far as possible.

Argentine Crops.—The crops in the Argentine, on which satisfactory and remunerative traffic receipts principally depend, are in a promising condition. The rains that have recently fallen throughout the cereal zone have improved the various plants under cultivation. The sugar and wool crops have also benefited by the good weather conditions. From the present outlook therefore there is every probability that the railways will show remarkable expansion in their receipts during the coming harvest.

Supply Trade News.

D. P. Lamoreux has resigned his position as president and general manager of the Beaver Dam Malleable Iron Company, Beaver Dam, Wis., to engage in other business. Mr. Lamoreux's present address is 1658 McCormick building, Chicago.

William L. Garcia, who has been with the Fairbanks Company, New York, for the past eight years as manager of its engineering and power transmission department, has resigned to take the same position with Flint & Chester, Inc., New York, effective October 6.

The Erie Foundry Company, Erie, Pa., has recently received an order for the installation of a steam hammer at Princeton, W. Va., for the Virginian Railway, and another for the installation of a steam hammer at Fort Wayne, Ind., for the Pennsylvania Lines West.

Manning, Maxwell & Moore, Inc., New York, has purchased the entire capital stock of the Putnam Machine Company, Fitchburg, Mass. The Putnam Machine Company is the pioneer machine tool manufacturer of the country, and was started in 1836 by Salmon W. Putnam and John Putnam. The plant now covers about 14 acres. By the purchase, the old officers and directors of the Putnam company automatically cease to hold office, and the following are new directors: Salmon W. Putnam, Alfred J. Babcock, John N. Derby, Percy M. Brotherhood and George D. Branston.

C. C. Bradford, manager of the Cleveland office of the United States Light & Heating Company, New York, has been made sales manager of that company, with office in New York; and R. B. Clark has been made acting manager of the Cleveland office, succeeding to the duties of Mr. Bradford. Mr. Bradford was born in Caldwell, Kan., on May 27, 1880. In his early youth he moved to Cleveland, Ohio. where he received his schooling. He graduated from the Case School of Applied Science in the electrical course. Mr. Bradford started his business career with the Willard Storage Battery Company, Cleveland, and became manager of the Chicago office of that company and then manager of the New York office. He resigned the latter position to go to the General Vehicle Company, Long Island City, as assistant sales manager. He remained with that company until 1909, when he was made manager of the New York office of the United States Light & Heating Company. After one year the branch office at Cleveland, Ohio, was established and Mr. Bradford was made manager, which position he retained until his appointment as sales manager with office at New York, as mentioned above.

C. C. Bradford.

TRADE PUBLICATIONS.

Pneumatic Tools.—The Chicago Pneumatic Tool Company has issued Bulletin No. 148 on hand drills and portable compressors.

Metal Flumes.—The California Corrugated Culvert Company, Los Angeles, Cal., has issued an illustrated booklet describing the Lennon smooth metal flume made from American ingot iron.

Railway Construction.

Canadian Northern.—An officer writes that contracts have recently been given to D. J. McDonald and to the Nettleton-Bruce Eschbach Company, to build 20 miles of the Canadian Northern Pacific from Patricia Bay into Victoria on Vancouver Island, B. C. (January 23, p. 190.)

Canadian Northern Pacific.—See Canadian Northern.

Chicago, Burlington & Quincy.—An officer writes that track on the line building from Powder River, Wyo., southeast to Orin Junction, 108 miles, has been laid to Casper, beyond which point the company will not lay any track this winter. Mixed trains will probably begin running from Casper west in October. Twohy Bros., Portland, Ore., have the contract for building this remaining link of the new route between Denver, Col., and Billings, Mont. (February 21, p. 373.)

Gulf, Freeport & Northern.—This company, which was recently incorporated in Texas to build from Freeport, Tex., northwest to Sealy, about 100 miles, has begun grading work, it is said, and the work will be pushed to completion. At Sealy connections are to be made with the Missouri, Kansas & Texas, and the Gulf, Colorado & Santa Fe. C. L. Sharp, vice-president and general manager; C. E. Clark, treasurer, Freeport. (July 25, p. 169.)

Kansas, Oklahoma & Southwestern.—An officer of this company, which was organized some time ago, writes that the plans call for building from Caney, Kan., southeast via Wann, Okla., Delaware and Nowata, to Vinita, about 60 miles. The line is to have maximum grades of one per cent., with six degrees of curvature. A contract was given last year to the Continental Construction Company, Caney, Kan., to carry out the work, which calls for handling 25,000 cu. yds. to the mile. S. M. Porter, president, Caney, Kan., C. J. Dalton, chief engineer, Lawrence.

Nueces Valley, Rio Grande & Gulf.—Incorporated in Texas with $25,000 capital and headquarters at Bellville, Austin county. The plans call for building from a point about a quarter of a mile east of Kitty, on the San Antonio, Uvalde & Gulf in Live Oak county, west to a point near the center of McMullen county, 25 miles. The incorporators include: J. H. Shary, Omaha, Neb.; W. A. Matthaei, H. F. Granau, C. R. Johnson, J. W. Brooks, H. T. von Rosenberg and R. E. Zeiske, all of Bellville, Texas, and J. W. Atkinson, Tilden.

Okeechobee Interurban.—An officer writes that this company has been organized with $1,000,000 capital and headquarters at Arcadia, Fla. The plans call for building from Arcadia southeasterly over Joshua creek, thence east to Kissimmee river, and eventually to the east coast of Florida, with a branch from this line southeast via Bigler, Hall City, Palmdale and May Port, to the mouth of Fisheating creek. An extension is also to be built to connect with Fort Myers, via LaBelle, and another line to connect with Sebring via Lake Childs. E. Prouty, manager, Arcadia, Fla.

Oregon-Washington Railroad & Navigation Company.—The West Coast, which was incorporated some time ago, to construct a new line over the Cascade mountains, from North Yakima, Wash., west to Puget Sound, it is said, recently filed plats and locations of a right of way through the Naches Pass. The route from North Yakima follows Naches river and the north fork of that river to the summit. On the west slope of the Cascades the line will follow White river through Buckley to a connection with the O.-W. R. & N. tracks near Auburn.

Porcupine Rand Belt Electric.—A charter was granted to this company last year to build lines through northern Ontario. The promoters are asking for a provincial grant of $4,000 per mile or a provincial guarantee for the bonds of several thousand dollars a mile. The line is to be built through a rich timber and agricultural section from the boundary of Ontario and Quebec immediately north of Larder and Oposatika lakes, crossing the Blanche river at Beaver House lake, and skirting Gull, Crystall and Kirkland lakes to a point on the Temiskaming & Northern Ontario north of Swastika, thence crossing that road west by

northwest to the Mettagami river. A connection is to be made with the T. & N. O. near Porcupine by a branch running north along the river. Another branch is projected across the Mettagami river to a connection with the Canadian Northern at Flying Post. The principal branch will parallel the interprovincial boundary, running north from a point between Larder and Oposatika lakes to Abitibi lake, and south to North Temiskaming and New Liskeard. W. J. James is vice-president, and James H. Tighe, managing director of the Porcupine Construction Company is interested.

Sacramento Valley (Electric).—An officer writes that the company will let contracts this coming winter to build from Red Bluff, Tehama county, Cal., south via Corning, Orland, Willows, Woodland and Dixon to Rio Vista in Solano county, about 160 miles. This work has been under consideration for some time, and the company expects to carry out the work during 1914. C. L. Donohoe, president; Melville Dozier, Jr., chief engineer, San Francisco.

Tri-State Railways Company (Electric).—Incorporated in Michigan with $100,000 capital, to build from Pioneer, Ohio, where a connection is to be made with the Toledo & Western, north to Hillsdale, Mich., about 20 miles. H. McClaue, C. H. Heller and M. T. Davis, of Hillsdale, and W. E. Elliott, Chicago, are interested.

Utah Roads.—According to press reports plans are being made to build from Wanship, Utah, on the Union Pacific, southeast to Kamas, about 15 miles. J. G. Jacobs, associated with capitalists of Salt Lake City, is understood to be back of the project.

Waterloo, Cedar Falls & Northern.—An officer writes that work is now under way building an extension from Urbana, Iowa, southeast to Center Point, six miles. A contract for the grading work has been given to R. A. Elzy, Marshalltown, and for the bridges to the Gould Construction Company, Davenport. The work involves handling about 20,000 cu. yds. a mile. The maximum grades will be 1 per cent., and the maximum curvature 2 deg. There will be one steel 21 ft. I-span bridge, and three creosoted timber trestles with ballasted deck, 150 ft. long. A station and a sub-station will be constructed at Center Point.

West Coast.—See Oregon-Washington Railroad & Navigation Company.

RAILWAY STRUCTURES.

Antigonish, N. S.—Bids are wanted October 3, by L. K. Jones, assistant deputy minister and secretary of the department of railways and canals, Ottawa, Ont., for constructing substructures of bridges on the Canadian Government Railways as follows: Over the West river at Antigonish, Nova Scotia; over Nashwaak river, New Brunswick, and over brook near Covered Bridge, N. B.

Center Point, Iowa.—See Waterloo, Cedar Falls & Northern under railway construction.

Charlotte, N. C.—An officer of the Norfolk Southern writes that work will be started in October on a six stall, square engine house, to be built at North Brevard street, Charlotte. The building is to be of brick construction, 90 ft. x 100 ft., and will cost about $15,000.

Fairbury, Neb.—The Chicago, Rock Island & Pacific has awarded a contract to E. T. Leek & Company, of Chicago, for a new passenger station to cost approximately $40,000.

Olney, Pa.—An officer of the Philadelphia & Reading writes that contracts have been let for abolishing four grade crossings to the McNichol Paving & Construction Co., Philadelphia, for the grading and masonry work, and to the American Bridge Company, New York, for the bridges. The crossings to be abolished are on the Philadelphia, Newton & New York, near Olney, at Taber, at Mascher, and at Fisher streets, and at Duncannon avenue.

Salina, Kan.—The Union Pacific has received bids for the construction of a new passenger station to cost approximately $50,000.

Railway Financial News.

Colorado Midland.—See Denver & Rio Grande.

Connecticut River Railroad.—H. E. Folsom has been elected a director, succeeding Charles S. Mellen.

Denver & Rio Grande.—The United States district court has sustained the sale of 7,731 shares of stock of the Rio Grande Junction to the Denver & Rio Grande. The sale of this stock had been opposed by the trustee for the bonds of the Colorado Midland. Heretofore the Rio Grande Junction had been owned jointly by the D. & R. G. and the Midland.

Detroit, Toledo & Ironton.—George P. Johnson, receiver, has notified the district courts that he desires to resign.

Louisville & Nashville.—Stockholders have authorized the directors to make an offer for purchase outright of the North & South Alabama. The road has been operated by the L. & N.

Missouri, Oklahoma & Gulf.—The directors of the Oklahoma City Terminal Railway, which has been receiving bonuses for the Missouri, Oklahoma & Gulf Terminals at Oklahoma City, have notified the Missouri, Oklahoma & Gulf that unless the company could show conclusively that it was ready to build the line from Oklahoma City to Henryetta, subscriptions to the bonus fund would be returned to subscribers.

New York, Ontario & Western.—The directors have elected Howard Elliott chairman of the board and confirmed the election of John B. Kerr as president.

Paragould Southeastern.—See St. Louis Southwestern.

Pennsylvania Railroad.—A brief announcement was made at the end of last week that the company had decided to sell its securities of coal companies. The Pennsylvania owns a controlling interest in the securities of the Susquehanna Coal Company and affiliated companies, which coal companies owned or operated about 17,000 acres of anthracite coal lands.

A block of bonds—the amount is not stated—of the Allegheny Valley, guaranteed by the Pennsylvania Railroad, has been sold to Kuhn, Loeb & Co., New York.

Rio Grande Junction.—See Denver & Rio Grande.

St. Louis & San Francisco.—A new protective committee to represent the interests of the stockholders has been formed as follows: Eugene Thayer, of Boston; Stacey Richmond, of Winslow Lanier & Co., New York; Frederick Bull, of Edward Sweet & Co., New York; and Charles H. Sabin, vice-president of the Guaranty Trust Company, New York. James Campbell recently sent a letter to stockholders offering to join with other stockholders to protect stockholders' interests without, however, the deposit of stock or the formation of a stockholders' protective committee.

St. Louis Southwestern.—Stockholders are to vote on October 7 on the question of leasing the Paragould Southeastern and guaranteeing principal and interest on the first mortgage 5 per cent. bonds. The Paragould Southeastern runs from Paragould, Ark., to Blythesville, 37 miles.

San Antonio, Uvalde & Gulf.—This company has asked the approval of the Texas railroad commission for an additional issue of $800,000 bonds.

Southern Railway.—It is understood that plans are being tentatively discussed for a new refunding mortgage which will provide for future capital requirements and refunding under a more comprehensive plan than is permitted by the present improvement and refunding mortgage. Plans have not passed the preliminary stage, however.

South African Line Completed.—The formal and official opening of the George-Oudtshoorn line, for all classes of traffic, took place on August 6.

Forty Killed in Russian Wreck.—A press despatch from Rostov, Russia, September 29, reported the wrecking of a passenger train, between Baku and Batum, by brigands, who tore up the track. Six cars were destroyed and 40 persons were killed. More than a hundred were injured.